PERSONALITIES

By George F. Taubeneck

Modernistic Teasers

A number of our friends who are in the business of distributing electrical appliances have been edging around to our left ear recently, looking around furtively before saying anything, and then asking in a still, small voice:

"What's Leonard got up its sleeve for next year?"

We answer, truthfully, that we don't know.

"Oh, yeah?" they grin malignantly. "I thought you an' me wuz pals."

It seems that the page advertisement with the "skywriting" which Leonard ran in the October 9 issue of ELECTRIC REFRIGERATION NEWS has created no end of curiosity. Some of the boys just can't get over the feeling that That Dam' Scotchman Petrie will have something new in his 1936 Leonard which may set competition back as much as the foot-pedal door-opener did.

As for us, we were even more impressed with the Kelvinator page in that issue. That photograph of all the executives sitting around the big Board of Directors' table gave us a picture of quite an assembly of Brains. Just for fun, turn to that issue in your files, and look up that advertisement again (page 5).

Then study the face of each individual around that table. Recall where you've seen some of those faces before. Take President GEORGE MASON. Successful Chrysler executive. Successful president of Copeland. Took over Kelvinator at a crucial time, came through magnificently. Now a respected figure in the councils of the great electrical industry.

Study the fine head of Vice President HENRY BURRITT. Onetime president of Leonard, and as such one of the longest-experienced executives in the refrigeration industry. Has kept his place as director of sales through many changes of administration and personnel, and is universally admired throughout the industry.

Next to him is "PAT" GEYER, keen-minded advertising agency head whose merchandising ideas have made him independently wealthy. Grew up with Frigidaire, and handled its advertising up to this Fall. Mr. Geyer, we couldn't help but notice, is eyeing Vice President H. G. PERKINS, the watchdog of the treasury, almost apprehensively.

(Perhaps Mr. Geyer has heard "JUD" SAYRE—now of RCA, formerly sales manager of Kelvinator—tell about the time he happened to pass by and overhear one of his associates pleading with Mr. Perkins for a salary raise. Pitifully the man related how his wife was ill, his children ragged, his home about to be foreclosed, his work suffering from malnutrition. The plea appeared to move Mr. Perkins greatly. For a moment Jud thought that the impossible was about to happen, that the man would be given his raise. Then he heard Mr. Perkins cry: "Throw this man out! He's breaking my heart!").

Further down the table is "HIKE" NEWELL and, skipping two, "DOC" HARLAN. In all Frigidaire's history, just two men have held the title of Vice President in Charge of Sales. These are the two men. And here they are, thinking for Kelvinator.

VANCE WOODCOX, former advertising manager of Kelvinator (now with Geyer-Cornell-Newell), and C. S. MITCHELL, present Kelvinator advertising manager, are at the table—giving Kelvinator the services of *two* topnotch, experienced advertising managers instead of one.

GODFREY STRELINGER and V. J. McINTYRE can contribute to the discussions a wide fund of practical knowledge gained from their experiences in the field for Kelvinator—actual selling experience which has been gained recently enough to be extremely valuable.

C. C. THOMAS, E. HEITMAN, and G. M. EVANS all have high standing in the engineering profession. Their presence at the table has seemed significant to more than one person who has commented on this unique advertisement.

Oh, yes. Count ALEXIS de SAKHNOFFSKY, the designer who is so much responsible for today's vogue for streamlining. We've met this gentleman around the publishing offices of *Esquire* (for which magazine he does those dashing drawings of streamlined objects), and at the Auburn factory, for which he has designed built-for-speed motor cars. Kind readers, this man is as advertised. He has more on the ball than LON WARNEKE.

We don't know who it was down at Geyer-Cornell-Newell who got the idea for those "modernistic teasers" advertisements, but take it from us, they've been producing the desired effect.

• • •

Stewart-Warner Revives

The resumption last week of dividend payments by the Stewart-Warner Corp. is something which is giving some of our friends—like FRANK HITER, CHARLEY D'OLIVE, JOHN DITZELL, and FRED CROSS—an occasion for indulging in a fine feeling of solid satisfaction.

Declaration of a regular semi-annual dividend payment of 25 cents a share, together with an extra payment of 25 cents a share, marks the first distribution to stockholders by this old-established automotive organization since November, 1930. And the gentlemen named above feel justly proud that they had considerable to do with the rebirth of Stewart-Warner.

Few major corporations during the depression appeared to have suffered the reverses which the Stewart-Warner Corp. had undergone. Dating from the very beginning of the depression this company experienced four successive years of losses, aggregating over $7,000,000.

The turn of affairs for Stewart-Warner came late in 1933, when a complete new management headed by JAMES S. KNOWLSON, chairman of the board, and JOS. E. OTIS, JR., president, was placed in charge of the company. Investigation disclosed that a rather thorough house cleaning and readjustment of affairs was necessary.

The first step by the new management was to place the company's accounting on a basis from which an *understandable* record could be obtained of profits or losses being sustained. Second was the elimination of unprofitable lines and concentration and consolidation of certain actvities; and third, the paying of special attention to the neglected problem of reducing overhead expenses and increasing general efficiency.

While Stewart-Warner has had an increased volume of business, this reduction of overhead and increased efficiency is considered by its officials to have been the major factor in returning the company to its present healthy condition. It is unofficially estimated that earnings in excess of $1.00 a share will be reported in the nine months to September 30, 1935, compared to 45 cents a share earned in the corresponding period of 1934

Results of the complete house cleaning and new policies instituted by the new management headed by Messrs. Knowlson and Otis first became apparent in 1934, when Stewart-Warner emerged into the black with earnings of 46 cents a share, and (with what is fully as important) a completely readjusted balance sheet which reflected the true position of the company under today's conditions, and with a materially strengthened working capital position.

Continuing this improvement into 1935, the first six months of the current year showed earnings of 82 cents a share against 43 cents a share reported in the first half of 1934.

Apart from the reduction of overhead expenses, improved operating methods, and increased efficiency of personnel, the better showing of the radio and refrigeration divisions of the Stewart-Warner Corp. is undoubtedly one of the most interesting parts of this picture.

The radio and refrigeration divisions in the past *had never shown a profit,* but were continued by the present management because they manifested possibilities of attaining an upward curve, and were absorbing an important part of the company's general overhead expenses to justify their retention.

Stating the case more concretely, in 1934 the radio and refrigeration divisions cost the Stewart-Warner Corp. several hundred thousand dollars in cold cash; in 1935, rather than a cash loss, these two divisions will show a substantial cash gain to the company, although the charging of the overhead to these accounts will prevent the showing of a book profit for radio and refrigeration operations.

But, it should be noted, the radio and refrigeration operaticns were not charged this overhead, it would have to be taken care of by other products manufactured by the company, so that in the last analysis Stewart-Warner radio and refrigeration divisions may be considered as being on a basis which is becoming increasingly favorable to the company, and that in 1935 for the first time the company has been definitely better off for the inclusion of these two products in their line.

Production of instrument panels, oil gauges and Alemite equipment for the automobile producers promises to be especially active in coming months.

Along with the improved earnings, the balance sheet position has been built up to a point where, at the close of September, 1935, cash was in the neighborhood of $3,000,000, against approximately $1,250,000 at the end of 1933, with a working capital ratio of around 6 to 1. Stewart-Warner has no bonded debt, or preferred stock outstanding, its entire capitalization being constituted by common stock.

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Motors Follow Suit

The amazing success of the electric refrigeration industry this year—especially during the latter part of the summer—is being attributed by many to materially reduced interest rates on time payment sales.

Apparently the motor car industry is taking a leaf from this book, for a new kind of motor car financing plan, which effects a lower cost to the purchaser and enables General Motors dealers to render the service in the simplest, most easily understood form, was announced yesterday by the General Motors Acceptance Corp. The new plan will be known as the GMAC 6 Per Cent Plan.

"This new plan is not only the simplest and most effective of its kind," declare General Motors officials, "but its lower cost feature will bring all units of the 1936 General Motors line within reach of new thousands of potential car owners, and should have a stimulating effect on the entire motor industry.

"To the best of our knowledge, the GMAC 6 Per Cent Plan represents by far the lowest cost national plan for the purchase of new cars in the United States today.

"In addition to this, the new car purchaser has for the first time in the history of automobile financing, a plan he can figure for himself. It completely eliminates those items known as 'carying charges,' 'service charges,' etc.

Actually, the GMAC 6 Per Cent Plan is as simple as A B C. To figure out his monthly payments, a prospective new car buyer has only to take the unpaid balance due; add to this the amount of his insurance and multiply the result by 6 per cent. The resultant figure is the entire cost of financing the unpaid balance and insurance for 12 months.

For payment periods longer or shorter than 12 months the cost is one-half of 1 per cent per month. This flat percentage is simply a convenient multiplier by which the cost may be computed and anyone can use and understand. The plan includes fire, theft, and accidental damage insurance written by General Exchange Insurance Corp.

The corporation further points out and recommends that by making the largest down-payment possible and keeping the length of the payment period as short as possible, naturally, the purchaser can effect additional economy.

The GMAC 6 Per Cent Plan is, of course, being offered by dealers in Chevrolet cars and trucks, Pontiac, Oldsmobile, Buick, LaSalle, and Cadillac cars.

Editors of the NEWS are inclined to agree that this plan will do more to put the financing of new cars on a sound business basis than anything yet conceived, since the prospective purchaser can figure exactly what his obligation will be and his consequent ability to pay.

Moreover, *he doesn't get gypped.* The writer of these lines had a bitter experience with an automobile finance concern a couple of years back (so carefully camouflaged were the charges that we didn't discover until too late that we were paying about 19 per cent interest—and then had to pay through the nose to buy the contract back). We have no doubt others have fared just as badly at the hands of finance sharks; and as a result will feel much more favorably inclined toward purchase of G-M cars.

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In Conference

George Kobick, G-E apartment house sales manager; Gen. Benedict Crowell, and Nap Boynton, G-E lamp division.

Wilds of Borneo

Two kerosene-operated Electrolux refrigerators are part of the equipment MR. AND MRS. MARTIN JOHNSON, motion picture explorers have taken on their expedition into the wilds of Borneo, President LOUIS RUTHENBURG, Servel, Inc., tells us.

One of the refrigerators is for household purposes, and the other will be used to cool tanks containing chemicals necessary for the development of photographic films.

The Johnson expedition plans to utilize a huge raft to be floated on the principal river of North Borneo. The refrigerator containing foodstuffs will be on this raft.

This is the first trip on which modern refrigeration has been taken by the Johnsons. The expedition is expected to last two years.

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Praise for England

An earnest trumpet-blower for England as a good refrigeration market is RALPH SEARLE, managing director of Kelvinator, Ltd., London, England. Mr. Searle was in Detroit recently, visiting the home office.

"Merchandising plans and methods for selling Kelvinators are much the same in England as they are in this country, except that the public over there is not as well educated to the value of electric refrigeration for the home as they are here," states the Kelvinator leader.

Mr. Searle came to this country immediately after opening the new showrooms, works, and offices of Kelvinator, Ltd., on Gray's Inn Road in London.

Advertising in women's journals, the better class of magazines and trade papers, window displays, billboard advertising and other sales promotion plans, similar to those we have, are used by Kelvinator, Ltd. to overcome the satisfaction English women have in their cool cellars which their grandmothers had built into their old houses.

Very little newspaper space is used because of its high cost, but a weekly radio paper which has a circulation of 2,250,000 is used extensively. The British Broadcasting Company, a governmental branch, prohibits the use of advertising on the radio.

The salesmen of Kelvinator, Ltd. sell directly to prospects, which they obtain themselves, and also handle all prospects secured from electric power companies and retail electric stores which handle Kelvinators.

Many of the larger department stores in London also sell Kelvinators. Outside of a 20-mile radius from London, agents, or distributors, handle the Kelvinator franchise, taking care of sales, installations and service.

Of the agents now with Kelvinator, Ltd., 90 per cent of them have handled Kelvinators since 1927. These agents cover all of England, Scotland, and Wales, outside of London.

"One of the best promotion plans we use for our salesmen," Mr. Searle declared, "is the awarding of our six directors' cups to the salesmen who sell the greatest volume of business over quota each month.

"The managing director's cup is awarded for the best year's record; and a new cup this year, donated by the general sales manager, goes to the salesman at the end of the year who has the greatest per cent of direct sales (sales made to prospects secured by the salesman) to total sales."

Lunch-Time Doesn't Mean Time-Out for Refrigeration Executives

When the various manufacturing executives attending the sessions of the Refrigeration Division of the National Electrical Manufacturers Association at the Palmer House in Chicago came to the time for lunch, they didn't halt their deliberations. Rather they had lunch served in their suite, and kept right on talking. (1) H. M. Johnston, Sparks-Withington; W. Paul Jones, Fairbanks-Morse; Charles J. Gibson, Gibson; (2) P. Y. Danley, Westinghouse; Johnston, Jones, Gibson; Charles D'Olive, Stewart-Warner; Louis Ruthenburg, Servel; (3) John F. Ditzell, Stewart-Warner; W. A. Carson, Sunbeam; J. H. Schroeder, Sunbeam; John Knapp, Norge; Frank Pierce, Frigidaire; J. A. Harlan, Kelvinator; Lewis Crosley, Crosley; and (hand, spoon) Ray Cosgrove, Westinghouse.

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REFRIGERATION SUPPLY JOBBERS ORGANIZE

Detroit Dealers Plan Appliance Code of Ethics

Credit Bankers to Meet With Dealers at Next League Session

DETROIT—Veteran retailers of household electric refrigerators here have formed the Better Retailers Appliance League of Detroit to further the interest of retailers, to collect and disseminate information on mutual problems, and to promote a cooperative spirit among the members for the benefit of all.

A meeting of the League has been scheduled for next Wednesday, Nov. 6, in the Starlit room, Webster Hall hotel, at which various problems in appliance selling that have come to the fore because of the convenient financing plan offered under the FHA modernization program will be discussed.

The league has the endorsement of the local credit bankers, including Commonwealth Commercial Bank, Detroit Savings Bank, First Bancredit Corp., and the Morris Plan Bank. The bankers will take an active part in next week's meeting.

It is anticipated that a 5-point code of ethics will be set up at the meeting.

Officers of the League, elected at the organization meeting, are C. Campbell, Campbell-Penfield Co., president; L. R. Richards, Nome Refrigerator Co., vice president; E. C. White, Gardner-White Co., treasurer; and F. J. Gleason, secretary and managing director.

Board of directors consists of the following members, in addition to the officers: H. Smith, The Central Stores; S. Lind, Lind's Mercantile Corp.; J. Ryal, Ryal's, Inc.; A. H. Kunert, Wellensiek Music Store; E. J. McAvoy, Wurlitzer Music House; F. Nutto, Electrical Specialty Service; A. Benjamin, Benjamin Appliance Co.

Dealers participating in the organization meeting included the following organizations:

The Central Stores, Gardner-White Co., Lind's Mercantile Corp., Nome Refrigerator Appliance Co., Campbell-Penfield, Inc., Crowley-Milner Co., Ryal's, Inc., J. L. Hudson Co., Wellensiek Music Store, Wurlitzer Music House, Approved Appliances, Inc., Good Housekeeping Shop, Electrical Specialty Service, and Benjamin Appliance Co.

Vilter & Baker Join Conditioner Group

WASHINGTON, D. C.—The Vilter Mfg. Co., Milwaukee, and Baker Ice Machine Co., Inc., Omaha, have been added to the membership of the Air Conditioning Manufacturers Association, W. B. Henderson, secretary of the organization, announced last week.

With addition of these new members, ACMA's rolls now include most of the substantial manufacturing elements in the air-conditioning field today, Mr. Henderson said.

At present, the organization is concerned mainly with formulating and making effective standards for air conditioning.

Case to Distribute Ice-O-Matic Line Thru Branches

BLOOMINGTON, Ill.—W. A. Case & Son Co., with headquarters in Buffalo and branch offices throughout New York state, Pennsylvania, Tennessee, and Michigan, has been appointed distributor of Ice-O-Matic household and commercial refrigeration equipment in those four states, announces M. V. Stagg, manager of the Ice-O-Matic division of Williams Oil-O-Matic Heating Corp.

The Case company will distribute Ice-O-Matic equipment independent of the plumbing and heating supplies which it manufactures.

Branch offices of the organization are located in Binghampton, Brooklyn, Buffalo, Jamestown, Newburg, New Rochelle, Niagara Falls, Rochester, Syracuse, New York City, and Tonawanda, N. Y., Erie and Scranton, Pa., Patchogue, L. I., Nashville, Tenn., and Detroit.

Distributor-Dealer Tax Considered by Mississippi House

JACKSON, Miss.—Mississippi distributors and dealers in electric refrigeration equipment face a stiff tax for the "privilege" of doing business, in a piece of legislation (House Bill No. 37-X) introduced Oct. 15 in the State house of representatives.

The bill, which is an act to amend the "privilege" tax laws of 1934, would impose a tax of $250 on the operator of a state-wide refrigeration sales agency; and $10 on each sub-agent for every store or showroom.

The proposed legislation further provides that if an operator holds an agency for only 40 counties or less, the amount of the tax shall be only $125, and if the operator is only a "dealer" and not a sub-agent—$50.

Covered by the proposed tax are a number of other items, chiefly office equipment, but the washing machine is the only other household electrical appliance which would be taxed.

Mississippi House of Representatives Bill No. 37-X reads as follows with respect to refrigeration:

"An act to amend Chapter 118, Laws of 1934, being the privilege tax law of the State of Mississippi, so as to repeal some of the provisions of the existing law, and to impose privilege taxes on certain trades, professions, callings and business; to provide for the enforcement and collection of the taxes, provide penalties for non-payment, and provide for certain exemptions."

Section 18 of this bill reads as follows:

"Upon each person engaged in the sale, lease, or exchange, or operating a general agency or a branch office for the sale, lease, or exchange of any of the following enumerated articles, and employing other agents, for each such agency a state-wide tax for each of the articles enumerated below, as follows:

Kelvinators, Frigidaires, or refrigerating machines of like character operated by gas or electricity $250.00

Upon each sub-agent of a person who has paid the above privi-

(*Concluded on Page 2, Column 1*)

4-Year Finance Plan Initiated by Furniture Store to Meet FHA Competition

BAKERSFIELD, Calif.—To meet competition set up by the provisions of the FHA modernization loan plan, the McMahan Furniture Co. here, offered a four-year payment plan on electric refrigerators, and, company officials state, thereby increased its refrigerator business 1,200 per cent.

Called a "Knock Out Deal," this payment plan was announced to the public in a full page newspaper advertisement. Centering the page was the picture of Joe M. Schaaf, manager and partner in the company. Pictures and statements of company employees edged the page-insertion. A 6-in. bold type figure "4" kept the time element prominent in the advertisement.

"Only with the aid of some such arrangement as this can the long-established dealer hope to get his share of sales while the FHA plan is in effect," said Mr. Schaaf.

"While we prefer shorter terms, we intend to follow this system as long as the FHA plan holds. The advantages of the plan," Mr. Schaaf stated, "include the money made on the carrying charges, and the store traffic caused by purchasers who come to make payments."

This 4-year payment plan also increased the size of the average sale, company reports indicated.

"Customers seem to forget the price and purchase what they need and want, when the terms are low, and are spread over a long period," said Mr. Schaaf.

Manufacturers of Parts Also Form Association at Detroit Meeting

Wholesalers of Parts Draw Up Constitution And Elect Officers

DETROIT—Jobbers of refrigeration supplies, meeting last Wednesday and Thursday at the home of ELECTRIC REFRIGERATION NEWS, banded together to organize the National Refrigeration Supplies Wholesalers Association, to insure the development of their rapidly growing branch of the industry along sound, healthy lines.

Formal constitution and by-laws, to regulate membership in and conduct of the business of the association, were drawn up and adopted.

Government of the association is in the hands of a board of directors of nine members, who will be elected, in sets of three, for three-year terms. This group, in turn, chooses the officers of the association from its ranks.

At last week's meeting, directors were elected for terms of one, two, and three years, so that a section of the governing body will come up for election next year and every year thereafter.

Directors elected for one year are: W. C. Griesser, Refrigeration Equipment & Supply Co., Chicago; H. W. Small, Thermal Service Co., Inc., St. Paul; and Howell E. Adams, Lewis Supply Co., Memphis.

The following were elected directors for two years:

J. M. Oberc, J. M. Oberc, Inc., Detroit; Robert Spangler, The Spangler Co., Inc., St. Louis; and H. W. Blythe, H. W. Blythe Co., Chicago.

Full-term directors are:

H. S. McCloud, Williams & Co., Inc., Pittsburgh; Charles A. Kabat, Paramount Electric Supply Co., New York City; and Irving C. Alter, Harry Alter Co., Chicago.

From this group, the following officers for the coming year were chosen:

President, H. S. McCloud; vice president, C. A. Kabat; treasurer, H. W. Blythe; secretary, J. M. Oberc.

Meeting Wednesday as an unorganized group, with a lot of common problems but no definite ideas of how to settle them, the jobbers came out of their session with at least a partial definition of the term "jobber," and with a number of temporary committees appointed to carry further the work of organization.

First thing the Wednesday meeting had to decide was this poser: what is a jobber, and what functions must a business perform to be considered a bona fide refrigeration supplies wholesaler?

After considerable discussion, the following tentative definition of the term was prepared for submission to manufacturers of supplies:

1. A jobber is a person, or company, who purchases merchandise (refrigeration) from at least five (5) manufacturers and resells same to service men, distributors, dealers, or the trade.

2. No jobber shall operate a service shop or organization, except for the trade, and no jobber shall do retail work.

The various elements of organization were placed in the hands of the following committees:

Nomination committee: H. W. Small, Thermal Service Co., Inc., St. Paul. W. C. Du Comb, W. C. Du Comb, Inc., Detroit. R. H. Spangler, The Spangler Co., Inc., St. Louis. Frank Langsenkamp, Jr., Langsenkamp Co., Indianapolis. H. E. Adams, Lewis Supply Co., Memphis.

Constitutional committee: Irving C. Alter, Harry Alter Co., Chicago. W. M. Applebee, Burstein-Applebee Co., Kansas City. R. E. Thompson, R. E. Thompson Co., St. Louis.

Finance committee: Herman Goldberg, Standard Refrigeration Parts Co., Chicago. W. H. Parker, Home Appliance Service Co., Greensboro, N. C. D. C. Lingo, D. C. Lingo Co., Houston, Tex.

Committee to contact manufacturers: H. S. McCloud, Williams & Co., Pittsburgh. J. M. Oberc, J. M. Oberc, Inc., Detroit. George Monjian, George Monjian Co., Chicago.

With a view to arriving at a basis of mutual understanding and coopera-

(*Concluded on Page 20, Column 1*)

Widened Program Is Planned at Meeting Of 200 Servicemen

By T. T. Quinn

DETROIT—That the forward-looking independent service man intends to become an increasingly potent factor in both present and future fields of refrigeration and air conditioning was evidenced when Refrigeration Service Engineers Society members held their second annual convention last Wednesday, Thursday, and Friday in Hotel Fort Shelby here.

More than 200 members of the organization attended the convention sessions, heard prominent persons in the refrigeration industry address them on subjects ranging from the successful operation of a business, from a financial standpoint, to automatic oil separators and commercial installations, and assisted in the formulation of the following broad program of advancement:

1. A speakers' service for individual chapters, under which representatives of leading manufacturers will be available as speakers at chapter meetings.

2. Organization of a "grievance committee," to handle all complaints arising among members of the Society as to business procedure.

3. Continuation of the efforts to obtain use of universal symbols in drawings showing installations of refrigerating machinery.

4. Widening of the Society's educational program to include the study of air conditioning.

5. Approval of a universal credit and collection system for members, to handle all credit and collection problems.

Memphis, Tenn., was tentatively selected as the site of the 1936 convention, subject to formal approval by officers of the organization.

(*Concluded on Page 15, Column 1*)

One G-E Dealer Sells 13% of Market and Another, 21%

BARABOO, Wis.—Sales of General Electric refrigerators to 13 per cent of the homes with domestic electric meters in a town with 1,356 meters, despite competition of another G-E dealer, the Wisconsin Power & Light Co., is the record of Stortz and Coughlin Hardware Store here.

Mt. Horeb Hardware Store, located in the small town of Mt. Horeb, Wis., has placed G-E refrigerators in 21 per cent of the domestic electric meters in that town. Eighteen refrigerators were sold during the month of May alone, reports Stanley R. Himsel, manager of the electrical department.

154,008 Washers Shipped To Dealers in Sept.

CHICAGO—Household washing machine sales for September reached a new high, with 154,008 units shipped as compared with 104,589 in September, 1934, and 144,283 in August of this year, reports J. R. Bohnen, secretary of the American Washing Machine Manufacturers Association here.

For the nine months ended Sept. 30, 1935, the association reports total shipments of 1,104,078 washers, as against 990,842 shipped by manufacturers during the same period last year.

Mechanical Refrigeration Taxes Shows Decrease

WASHINGTON, D. C.—Manufacturers of mechanical refrigeration paid taxes totaling $456,620 last month, showing a slight decrease from the $477,030 paid in September, 1934, indicates a report by the Bureau of Internal Revenue of the Treasury Department on the payment of excise taxes.

Parts Makers Would Bar Retail Service Work By the Jobber

By Phil B. Redeker

DETROIT—Nearly 100 representatives of manufacturers of refrigeration parts and supplies met here last Wednesday and Thursday to lay the groundwork for a permanent association of such manufacturers, and to draw up a standard definition of a jobber of refrigeration parts and supplies as a first step towards bringing some sort of order into the refrigeration parts business.

General purpose of the association, according to opinions voiced at the meetings, will be to sponsor better cooperation among the parts manufacturers in establishing the distribution of their products on a high plane, and coordinating their efforts to support the legitimate distributing outlets for their products.

At the first meeting held Wednesday at the home of ELECTRIC REFRIGERATION NEWS, representatives of manufacturers present appointed a committee which was later named as a board of directors, which will function temporarily or until their successors are elected.

J. D. Colyer of Wolverine Tube Co., chairman of the board of directors, was empowered to appoint a secretary to notify all manufacturers not present of the formation of the association, and to otherwise look after the activities of the association.

Frank J. Gleason, formerly connected with Universal Cooler Corp., and now director of the Michigan Refrigeration Association, was tentatively named to this job by Mr. Colyer.

Other members of the board of directors, in addition to Mr. Colyer, include:

C. M. Brown, Tecumseh Products Co.; David H. Daskal, Perfection Gear Co.; J. S. Forbes, Kerotest Mfg. Co.; H. V. Higley, Ansul Chemical Co.; Lester U. Larkin, Larkin Refrigerating Corp.; F. B. Riley, American Injector Co.; K. B. Thorndike, Detroit Lubricator Co.; F. O. Webster, Cutler-Hammer Co.; and Morrill Dunn, McCord Radiator & Mfg. Co.

Plans are being made for a meeting of the parts manufacturers within the next six weeks, at which time the organization will be completed and a constitution and code of ethics presented.

The following definition of a jobber, formulated at the meeting, was accepted by manufacturers representatives who attended the meeting, and was also tentatively accepted by the jobbers, to whom it was read at one of their meetings. The definition is as follows:

"The definition of a refrigeration supplies jobber or wholesaler hereinafter defined does not include the type of distributor who is recognized by some manufacturers as national or territorial sales-agents. It is recommended, however, that these so-called sales-agents restrict their sales at wholesale prices to those concerns who conform to the following definition of a refrigeration supplies jobber.

"In the following definition the term 'trade' is defined as including the following:

"1. Refrigeration Serviceman.
"2. Refrigeration Dealer.
"3. Refrigeration Distributor.
"4. Refrigeration Wholesaler.
"5. Refrigeration Contractor.
"6. Ice Cream Manufacturer.

"The term 'Refrigeration Supplies Jobber' is defined to mean anyone performing the following functions hereinafter mentioned, and who does no retail service work for consumers, but may do service work for the trade on a wholesale basis. Provided, however, such jobber does not perform such wholesale functions merely to secure wholesale prices for the benefit of allied persons, firms, or corporations.

"A jobber should perform the following functions:

"1. Purchase at wholesale prices at least five different essential products necessary to supply adequately the requirements of the trade.

"2. Maintain and warehouse a stock

(*Concluded on Page 2, Column 2*)

Regional Meetings Started by G-E

CLEVELAND—A series of regional conferences are being held with General Electric home appliance distributors by P. B. Zimmerman, manager, and A. M. Sweeney, sales manager of the specialty appliance department of the company.

Meetings so far have been staged in Dallas and Los Angeles. At the Dallas conference distributors attended from El Paso, Houston, Dallas, Oklahoma City, Little Rock, New Orleans, and Denver. Attending the Los Angeles conference were distributors from San Diego, Los Angeles, San Francisco, Butte, Portland, Salt Lake, Seattle, and Fresno.

Other meetings scheduled, with the distributing centers to be represented at each, are:

Chicago, Oct. 31—Davenport, Fargo, Omaha, Des Moines, St. Paul, Chicago, St. Louis, Kansas City, Milwaukee, Minneapolis.

Cleveland, Nov. 5—Columbus, Cincinnati, Toledo, Detroit, Indianapolis, Charleston, Cleveland, Syracuse, Wheeling, Pittsburgh, Louisville, Buffalo.

New York, Nov. 8—Atlantic City, Providence, Springfield, Boston, Schenectady, Waterbury, Washington, New York, Philadelphia, Harrisburg, Newark.

Atlanta, Nov. 12—Charlotte, Birmingham, Richmond, Columbia, Nashville, Atlanta, Baltimore, St. Petersburg.

Purpose of the conference is to make tentative plans for sales drives, advertising and promotion for next year.

Mississippi Plans Tax on Distributors & Dealers

(*Concluded from Page 1, Column 2*)

lege tax, for each store or showroom where any of the above enumerated articles are kept for sale or display a tax of 10.00

"Provided that any person having an agency for any of the enumerated articles, with authority to employ sub-agents in 40 counties, or less, shall pay one-half of the tax imposed for state-wide agency. And any person acting as dealer in, or agent for any of said articles, and not being a sub-agent of any person who has paid a state-wide tax, and not employing sub-agents, the tax shall be one-fifth of the amount imposed for state-wide tax.

"Provided further, that the taxes imposed by this section shall be payable to the state tax commission, and all licenses issued for the privileges taxes shall be issued by the tax commissioner.

"Provided further, that no traveling representative or salesman or any person who has paid the tax as an agent or sub-agent shall be required to pay any additional tax."

Three New Dealers Will Handle Crosley Line

CINCINNATI—Three new Crosley dealers named recently are: J. W. Dyer, Fairmont, Ga., appointed by Beck & Gregg Hardware Co., Atlanta; Hecht's Reliable, Baltimore, appointed by Lincoln Sales Corp.; and the South Jersey Furniture Co., Woodbury, N. J., franchised by the Graybar Electric Co., Crosley distributor, Philadelphia.

Parts Makers & Jobbers Trade Ideas at News' Open House

Top Row: (1) W. H. Percival, C. L. Percival Co., Des Moines; H. L. Dahm, G. S. Robins & Co., St. Louis; A. Ivan Brickner, Federal Refrigerator Co., New York City; J. A. Cassady, Langsenkamp Co., Indianapolis. (2) F. J. Gleason, tentatively appointed secretary of the new parts manufacturers association, Detroit; W. Stark, Cutler-Hammer Co., Detroit. (3) M. K. Jasperson and Harry W. Lindsay, Peerless Ice Machinery Co., Chicago; H. V. Higley, Ansul Chemical Co., Marinette, Wis.

Bottom Row: (1) D. C. Lingo, D. C. Lingo Co., Houston, Texas; F. C. Swanson, Paramount Elect. Supply Co., New York City; Boyd Evans, United Refrigeration Supply Co., Memphis, Tenn. (2) H. W. Small, Thermal Service Co., St. Paul; George Monjian, George Monjian Co., Chicago; Irving Alter, Harry Alter Co., Chicago. (3) John Belleman, News linotype operator; H. S. McCloud, Williams & Co., Pittsburgh; F. S. Langsenkamp, Langsenkamp Co., Indianapolis; W. C. Dever, Detroit representative, Virginia Smelting Co.

Parts Manufacturers Consider Plans for Association and Define 'Jobbers'

(*Concluded from Page 1, Column 5*)

of such products to supply adequately the requirements of the trade.

"3. Distribute to the trade only a catalog, either of his own or an aggregation of his manufacturers' catalogs. In case of a catalog of his own, the manufacturer should have the privilege of editing those pages or parts of pages covering his particular products."

The following list of those who attended the meeting is not complete, as several late arrivals failed to register either at the meeting or for the "open house" which ELECTRIC REFRIGERATION NEWS held throughout the afternoon.

Alco Valve Co., Inc., St. Louis
R. L. Sparks
F. D. Turner

Allen-Bradley Co., Milwaukee, Wis.
J. R. Decker
J. Petersen

American Brass Co., Waterbury, Ct.
M. B. Allan
John F. Payne

American Injector Co., Detroit
F. B. Riley
E. R. Deluiz
O. F. Nelson
H. B. Trix

Ansul Chemical Co., Marinette, Wis.
H. V. Higley
L. C. McKerson
Eugene P. Oppermann

Automatic Products Co., Milwaukee, Wis.
Roy W. Johnson
E. A. Valler

Bridgeport Brass Co., Bridgeport, Ct.
George W. Yanss

Bush Mfg. Co., Hartford, Conn.
C. T. Bappler

Commonwealth Brass Corp., Detroit
N. A. Henwood
P. Tazelaar

E. R. Capewell Co., Philadelphia
A. D. Clark

Cutler-Hammer, Inc., Milwaukee, Wis.
F. U. Webster

Dayton Rubber Mfg. Co., Dayton.
Carman Adams
J. C. Davis

Detroit Lubricator Co., Detroit
I. J. Knudson
K. B. Thorndike

R. & H. Chemicals Dept., E. I. du Pont de Nemours & Co., Wilmington, Del.
E. W. McGovern

Electrimatic Corp., Chicago
Charles F. Toussaint
E. M. Toussaint
H. S. Dekker

Ermstat Co., Philadelphia
George C. Tatem
William Weirich

Fedders Mfg. Co., Inc., Buffalo, N. Y.
H. E. Rieckelman
Marc Shantz

Federal Refrigeration Co., New York
A. F. Brickner

Frigidaire Corp.
W. V. Richards
A. C. Ellerbusch

Henry Valve Co., Chicago
C. V. Gary
Guy J. Henry

Imperial Brass Mfg. Co., Chicago
C. H. Benson
Fred R. Chope

Kerotest Mfg. Co., Pittsburgh
John S. Forbes
J. A. Strachan

Kold-Hold Mfg. Co., Lansing, Mich.
O. D. Greenlee

Larkin Refrigerating Corp., Atlanta
M. P. Fugle
Lester U. Larkin

McCord Radiator & Mfg. Co., Detroit
Morrill Dunn
D. P. Heath
R. M. Hyde

McQuay, Inc., Minneapolis, Minn.
R. C. Colman
J. W. Bassett

Mayson Mfg. Co., Detroit
Edward W. May

Mueller Brass Co., Port Huron, Mich.
E. F. Parker

Peerless Ice Machine Co., Chicago
R. W. Kritzer
M. K. Jasperson
M. W. Knight
Harry M. Lindsay

Penn Electric Switch Co., Des Moines
Paul Penn

Perfection Gear Co., Harvey, Ill.
D. H. Daskal

Refrigeration Economics Co., Canton
F. M. Bennett

Spoehrer-Lange Co., St. Louis
H. T. Lange

Square D Co., Detroit
C. A. Schaefer
John B. Schifflin

Steel Sales Corp., Chicago
Albert Duce

Tagliabue Mfg. Co., C. J., Brooklyn
R. A. Skinner

Temprite Products Corp., Detroit
James Goodwin
George Hohner
J. M. Johann
Gordon Muir

Trenton Auto Radiator Works, Trenton, N. J.
Israel Kramer

Victor Mfg. & Gasket Co., Chicago
Edward Gammie

Virginia Smelting Co., W. Norfolk, Va.
Chas. W. Johnston

Wagner Electric Corp., St. Louis
R. L. Wells

Wolverine Tube Co., Detroit
J. D. Colyer
W. C. Gernhart

Tropical Freezer to Sell Eight Lines

DAYTONA BEACH, Fla.—Tropical Freezer Equipment Co., manufacturer of beverage coolers and wholesale distributor of commercial refrigeration equipment, which recently moved to new quarters here, has been appointed manufacturer's representative for southeastern states by the following eight companies:

Fogel Refrigerator Co., Philadelphia; Merchants & Miners Corp., Philadelphia; C. L. Percival Co., Des Moines; Marlo Coil Co., St. Louis; Cutler-Hammer Corp., Milwaukee; Harold L. Schafer, Inc., Minneapolis; Sanitary Electric Co., Fond du Lac, Wis.; and Palmer Electric Co., Detroit.

On Jan. 1 the company plans to introduce a new room cooler, which may be obtained in six different sizes, and a new type of combination display and storage fish and poultry case. Both products will be manufactured at the company's plant here.

The company's new quarters, located at 410 Magnolia Ave., house the plant, warehouse and offices. A new department has been added to handle general metal working, roofing, and heating contracts. G. Wallace Hall will manage this department and the manufacturing department.

Other officers of the corporation are William McElroy, treasurer and general manager, and F. O. Darling, secretary and sales manager.

Apollo Appoints 20 New Refrigerator Dealers

NEWARK—Apollo Distributing Co., Crosley outlet here, has appointed 20 new dealers for Crosley electric refrigerators since Fred Goldberg, general manager, returned from a European tour. This distributorship has also signed up 150 new radio dealers, Mr. Goldberg states.

Methods of Mass and Outside Selling Are Described by Norge Merchants

Due to increased interest in home-making arts, housewives are eager to attend group demonstrations, lectures, cooking schools, and other mass selling events to learn newer and more efficient methods of home-making.

By adopting a continuous mass selling program such as this, the dealer is able to obtain multiple selling effect with little or no extra sales expense. A group can be swayed more easily at a central meeting than an individual on her own doorstep.

A merchandising method such as this provides half-sold prospects to the selling organization. Such meetings create good will which make the prospects much more easily approached and closed in the home. Group events have news value and the dealer can gain free publicity in the local newspapers.

Editor's Note: Prepared under the direction of James A. Sterling, director of advertising and sales promotion for Norge Corp., and Gerald E. Stedman, vice president in charge of market planning for Cramer-Krasselt Co., the Norge Merchant Training Manual is a composite of information on successful merchandising practices gleaned from Norge dealers all over the country.

Utilizing lengthy questionnaires, Messrs. Sterling and Stedman drew out from the Norge field organization the best dealer selling and operating methods which have been evolved from their experiences in selling electric refrigerators during the last several years.

These gentlemen have granted ELECTRIC REFRIGERATION NEWS permission to extract and condense information contained in this manual—a job which has been completed by Frances McNamara of the editorial staff.

Dealers have used a wide variety of locations and methods in promoting mass selling events successfully. Included among types of locations are the neighborhood theater, the dealer store, a central hall, outside club rooms, and schools.

Use of Neighborhood Theaters

Neighborhood theaters may often be engaged for a morning or afternoon mass selling event. Often the theater manager ties in by cooperative promotion in passing out coupons for two or three weeks preceding the event, which entitle those attending to draw for some product to be given away on the night of the showing. The theater manager may place an exhibit of the products in the theater lobby. Group promotions give the theater a capacity audience on off-nights.

Dealer stores frequently have facilities for small meetings. Some have meeting rooms for the use of local clubs or bridge parties; others have model kitchens with enough space to accommodate a small audience; and still others can clear a part of their floor of merchandise in order to take care of small groups.

Sometimes a central hall can be used by one or more dealers for a special mass selling event. Vacant stores or seldom-used auditoriums can be engaged at small cost.

Outside club rooms furnish locations for mass selling events. Many fraternal and religious organizations, having meeting places of their own, are glad to sponsor a promotion of this sort for the dealer. In this way, they can raise money by charging a small admission.

Prospects Reached by Schools

Schools furnish a means of reaching students or parent-teacher meetings. Many schools have domestic science rooms, or auditoriums where such demonstrations may be held.

The dealer is wise to start off with the mass selling program with some spectacular event designed to get a large crowd of women. After that, he should hold regular weekly group meetings in the store. These meetings will establish his store as an educational headquarters on home-making methods. Through these meetings enough prospects may also be obtained for the selling organization to work on during the week.

Some dealers invite officers of all the women's clubs to the initial demonstration. Through the support of these women, each club may be induced to sponsor personally one of the weekly events.

Types of Group Meetings

There are several types of group meetings — home-makers' matinees, store "sociables," cold cookery carnivals, home-making schools, and church "sociables."

Matinees should be held in the dealer's store if possible. Requirements are a clean place with sufficient chairs to accommodate the group, and a properly heated and ventilated room. The program should be designed to last no longer than two hours to permit attending women to get home in time to prepare the evening meal. If prizes are offered they should be of a simple nature such as a set of refrigerator dishes.

If the dealer's store is equipped with a meeting room, he might throw this open to the use of women's clubs for such things as bridge parties, quilt-tying parties, rummage sales, and sewing circles. He should have a good display of his products around the room, and if possible, he should arrange to give a demonstration of his product sometime during the meeting.

Cold Cookery Carnivals

Weekly cold cookery demonstrations or a month's cold cookery carnival is a good sales builder. If the carnival idea is used, the dealer may back up the promotion with neighborhood parades, cold cookery contests, or luncheon parties sponsored by him before various clubs. These promotional stunts will create community interest.

Regular weekly schools dealing with the operation and use of home appliances will attract a great deal of store traffic. Women are interested in work savers, such as electric refrigerators, ranges, washers, etc.

Churches engage in promotions to raise money for church funds much more than they did in pre-depression days. Church societies frequently offer to stage group demonstrations in the church with all materials furnished free. Members attending pay a small admission fee which goes to the church fund.

Salesmen Distribute Tickets

Dealers may supply their salesmen with tickets for each group event with instructions to pass them out to their weekly prospects. These tickets serve as a door opener and result in more people attending the meetings.

Adults are usually interested in children and willing to help them. By instituting a penny hunt or some similar feature, the dealer can enlist children to pass out attendance tickets. Special prizes may be awarded to the child who produces the greatest attendance.

The best way for the dealer to organize mass selling on a regular basis is to retain a home economist. He should give her supervision of all phases of the mass selling program, inside and outside the store. The home economist may be a local woman trained by one of the factory or distributor staff of home service experts. Often wives of dealers, interested in the success of their husbands, like to manage mass selling programs.

Outside Selling

The good merchant's store is not bounded by four walls—it is as big as his surrounding neighborhood. Outside selling is as important to retailing success as store selling.

With regard to refrigerators, ranges, and washers, a woman frequently feels a crucial need for some appliance when difficulties arise during the course of her daily housework. By the time she gets to the store this need is usually forgotten. If outside selling is done, the salesman often meets the woman in her home when her feeling of need is greatest, and he can convert her feeling into a desire to purchase.

Sidewalk Selling

Outside selling includes all sales impressions that can be set up outside the store—not merely the outside selling activity directed to the home. For instance, sidewalk selling offers a means of attracting attention of passersby who might never have entered the store.

For these sidewalk activities, the merchant may use demonstrations, or tests performed in the open; he may paint footmarks on the sidewalk leading into the store; or he may pass out samples of frozen desserts to passersby or distribute them at meal time to families within close reach.

Neighborhood promotion is another type of outside selling which may be used to gain greater voluntary store traffic. During the summer, when housewives spend a great deal of time on front porches, a parade attracts unusual attention. Announcement handbills may be distributed at doorsteps as the parade moves along.

Traveling Displays

Another means of neighborhood promotion is the use of traveling displays and demonstrations. A truck equipped with an attractive display of the dealer's products may be decorated and spotted at residential corners. Four blocks can be worked by the outside sales crew without moving the truck. Salesmen may go up and down each block and invite women to attend the demonstration.

By this means, a sale may be made, permission to give a home demonstration may be obtained, an appointment may be made with a husband and wife for a sales presentation, or a prospect may become interested and come to the store demonstration.

Telephone Canvasses

Telephone canvasses increase the dealer's influence in the neighborhood. By means of the telephone, neighboring housewives may be invited to attend daily group demonstrations. The persons making the telephone canvass should have a pleasant telephone voice, be able to answer any question about the product that may be asked, should let the prospect ask as many questions as she wishes, and should not be discouraged if the prospect hangs up before the conversation is finished. Follow-up on all details of the conversation is necessary.

Other means of neighborhood promotion include handbills, mimeographed news bulletins and door hangers.

The wise dealer uses a rotation plan between floor and outside selling, that is, one or two days a week of floor selling activity for each salesman plus home selling in the neighborhood for the remainder of the week.

Success of the dealer depends on success of his salesmen. Time is the salesman's capital. The merchant should see that the salesman's time is productive—that his outside salesmen use the maximum amount of time in actual selling. If the dealer does not supervise his salesmen properly, they are liable to waste valuable time, become discouraged, and quit. Excessive personnel turnover soon discourages the dealer in outside selling.

Record Kept on Prospects

The dealer should keep a card record of every home within his reachable neighborhood, which depends upon the location of the store, type of city in which he operates, traffic conditions, and the size of the merchant's operation.

On each card a record should be made of the prospect's present condition—whether the home is owned or rented, number in the family, probable income, credit condition of the wage earner, trading habits, and what is owned from the standpoint of electric appliances.

In making this sales possibility census, the dealer may employ outside influences to get the information he desires—meter readers, grocery boys, and others. The condition of the particular prospect indicates the type of approach needed to gain a hearing for the outside salesman.

Rules for Effective Selling

There are eight principal rules to follow to obtain effective outside selling:

1. A methodical attack should be planned. The reachable neighborhood should be worked by districts. Concentration on the district being worked until temporarily cleaned up, permits the use of direct mail, truck demonstrations, group selling, and other promotional activities to mutually acquaint groups.

2. The dealer should provide each salesman with a daily pattern of activity, in order to obtain maximum selling effectiveness. Each salesman should be given a daily list of at least 10 prospects, who have been presold by direct mail, telephone canvass, mass selling, or some other means. When he has contacted these prospects, the salesman should make a report to the dealer on the results of each interview.

3. A report on all interviews should provide reasons why sales are lost. A "lost sale" analysis should teach salesmen what mistakes to avoid.

4. The dealer should hold a regular weekly round table with his salesmen to go over their work, their prospects, and their problems.

5. An outside volume percentage and a quota should be established for all salesmen to reach. A definite goal will make any man strive harder for success.

6. The dealer should supply his salesmen with proper approach material. The salesman should not waste his time in approaching strange prospects—the dealer should make contact (by direct advertising, group selling, or neighborhood promotion) which will gain a favorable reception for the salesman when he calls at the home.

7. Salesmen should be trained carefully in outside selling technique. In addition to this, it is wise for the dealer to visit prospects with the salesman from time to time to see that his presentation is being given properly.

8. Selling tools, such as letters of local testimony to prove each sales point, or ready reference cards should be provided to each salesman by the dealer.

Sales Contests & How to Run Them

NO. 13—QUOTA MAKERS GET PRIZES OF HIGH QUALITY MERCHANDISE AND NON-WINNERS MUST CARRY LEMONS WITH THEM

By John Kumler, Sales Contest Manager
Buckley, Dement & Co., Chicago

Here's a moss covered contest plan you may have missed.

This plan is good in the spring and fall for rain coats, in May for straw hats, or in August for felt hats.

Get a local store to let you have a sample of whichever of these items you care to use. Show this sample to your men and tell them that those who get a certain quota within a specified period of time, will be given an order to get a duplicate of that sample free at a certain store (name it—and let it be a good one).

In addition to this, the winners shall have the sole privilege of wearing their new piece of apparel in the office; and all non-winners when meeting or passing a winner must tip their hats to him; must always use "sir" in addressing him; and must carry a lemon to show a winner whenever he asks to see it—with a 50 cent penalty if they refuse.

Naturally, as the winners increase, the pressure on the non-winners will be increased (by the divine right of cocky salesmen who will exercise their rights to the fullest extent). And then watch the sales roll in.

Caricature Advertising Pays Dealer Profit

SEATTLE—"Make them laugh and you make them buy."

On this theory, Frederick & Nelson, local department store, has built up an advertising campaign with humorous copy and caricature illustrations leading the reader into the sales features of Grunow refrigerators.

Titled "Work of Art by Grunow," one insertion copies the idea used by Sinclair Lewis in his book "Work of Art," with a chapter by chapter account of the evolution of refrigeration methods employed by the successive members of the Trueblood family.

Another advertisement asks a beaproned young matron: "Are you on speaking terms with your refrigerator?" The copy elaborates the possible social errors of an electric refrigerator.

This series of advertisements good naturedly poked fun at old-time refrigeration methods, and suggested that readers get up-to-date by purchasing a new Grunow model.

Shaw Joins Westinghouse Advertising Agency

CLEVELAND—R. C. Shaw, formerly with the advertising division of the specialty appliance department of the General Electric Co., has joined the staff of Fuller & Smith & Ross, Inc., advertising agency.

In his new position, Mr. Shaw will work on the Westinghouse Electric & Mfg. account. He has also worked for Batten, Barton, Durstine, & Osborn, Inc., advertising agency.

BOOKS

The Consumer—His Nature—and Changing Habits

Author: Walter B. Pitkin. Publisher: The McGraw-Hill Book Co. Pages: 416. Price: $4.00. Book Review by Frances McNamara.

"PRODUCTION technique must be based on the work of physicists, chemists, and engineers; but consumption technique must be founded on the work of psychologists, assisted by economic geographers and statisticians," is the thesis of Walter B. Pitkin in his book "The Consumer—His Nature and Changing Habits."

The author divides his book into six main divisions, titled as follows: "How Wealth Accumulates"; "The Web of Life"; "Factors Limiting Volume Consumption"; "Classes of Consumers"; "The War Between Maker and User"; and "The Thousand-Year Truce."

Consuming, states the author, depends upon money which is gained by plain hard work, by lawlessness, or by making things to sell to people who have the price and the wish for such things (or by any combination of these methods). As most people get ahead by making things for others, they must learn what people want and what they *will* and *can* pay for their desires.

Skill Limits Consumption

Both wealth and what an individual wants depend on his mentality, his temperament, his experience, and his whole philosophy of life. "Man," says Pitkin, "in all of his attitudes, interests, and capacities, is an integral personality. Whatever he does is a joint product of his intelligence, his energy, his age, his training, and his emotions. Thus as a learner. Thus as a toiler. Thus as a saver. Thus as an investor. Thus as a spender."

Many consumers refuse to buy something because they either have no mechanical skill or imagine they haven't such skill, even though they need only push a button to operate a mechanical device. Thus, says the author, skill or lack of skill is bound to limit consumption.

Intelligence is another factor that limits consumption in a more or less subtle way. The general inclination of high intelligence is to get the most for the least, which includes maximum economy of effort, maximum time saving, maximum satisfaction relative to time and effort and money.

Intelligent Buyer Follows Budget

The intelligent consumer buys and uses things on a budget. It may not be a formal one, but it is there as a behavior pattern. "And the primary purpose," says Pitkin, "is not to save money; it is to pattern one's spending so as to secure the maximum satisfaction on a given income."

The first principal of intelligent choice—it is more important to avoid an evil than to gain a good—underlies the technique of organizing one's life and thus, one's spending.

The author deals briefly with the contribution of the working girl to consumption. He points out as follows: "Figure out for yourself their contribution to volume consumption when you know that in 1930 there were 1,481,693 workingwomen in these occupations alone spending not more than 55 cents a day on clothing and 20 cents a day on all other mass production commodities except food."

'Aristocrats of Labor'

"Aristocrats of Labor" are the high school graduates who establish themselves in the fields of high skill or in political fields, etc. Here they earn more than the common garden variety of laborer yet do not have to spend more in proportion to their wage scale. For instance, the young engineer with a minor job in a big corporation may have to spend a great deal in proportion to his earnings to move in the right circles.

The young foreman who manages 20 men in the factory of the same company lives next door to these same men and has practically the same standard of living as these men he "bosses." Thus the foreman can save 10 times as much as the engineer.

It has been found that domestic appliances begin to appear in homes just as soon as income approaches the $2,000 a year mark. For instance, a survey made in Appleton, Wis., by *Time* shows that 55 families out of every 1,000 with income under $2,000 buy electric refrigerators, but 123 out of every 1,000 whose incomes range between $2,000 and $3,000 buy them.

Another limiting factor in volume consumption is the effect of emotions on consumer behavior. Some students of the consumer, such as Mahin, claim that emotions and their related modes of sentiment and temperament are the key to all consumer behavior; Pitkin believes this is a serious overstatement but admits there is some truth in it.

The desire for safety is a major cause in limitation of volume consumption. "America," declares the author, "is the land of insecurity . . . Thus our unrest and everlasting discomfort find us armed to the teeth—in savings, investments, and insurance."

Fear of poverty isn't the only reason for the desire for safety. There are others listed by the author as: the desire to have children begin at a higher living level than did their parents; the craving for security with freedom from labor in late middle and old age; the wish to forestall emergencies, such as sickness, unemployment, losses during business depressions, etc.

Buying Increase Limited

If all these motives did not combine, most families enjoying incomes of more than $10,000 would cut down on savings and expand volume consumption. In addition to all these motives which limit volume consumption, it must be remembered that one cannot indefinitely increase his ability to use more and more goods.

A foe of mass consumption, Pitkin declares, is a man such as Thomas A. Edison who "squeezed the fruit of life to its dry rind, not by consuming, but by creating. And does not the world esteem him the more highly for that? America's noblest spender, as a consumer, is William Randolph Hearst; would any champion of mass consumption set him on a pedestal higher than Edison's?"

Age is another limiting factor in volume consumption. The total personality varies with the years, affecting appetites, interests, and capacity to use and enjoy things.

Children use their immediate elders as models of approved behavior. They may have no spending money to use as they choose, but can usually wheedle parents into selecting and purchasing what is approved by the young.

Consumption Scatterbrained

Adolescents usually have some free spending money for luxuries and trifles. At this time, the author says, they begin to decide with more and more finality what they will and won't buy and use.

The author concludes from observations made that regardless of economic or social groups, the pattern of youthful spending is much the same—that diffuse and scatterbrained consumption, as a rule, characterizes the whole age group.

Marriage is a critical point in consumption. Here the newlyweds have to compromise and for the first time, perhaps, they are forced to do some headwork before buying. Here is the critical point where their intelligence as buyers and spenders begins to count. When children arrive, buying is still more carefully considered.

Middle aged consumers usually have desires that have become more or less fixed by this time. The senile have few, simple wants, and are, for the most part, dependent on charity.

Race and religion are, of course, limiting factors to volume consumption. For instance, race horses—such as the English passion for tea as compared with the American yen for coffee. An example of the influence of religion on volume consumption is the compulsion the Mormon church has on the buying of tobacco.

An important item in the American standard of living, Pitkin points out, is that of leisure. Munitions plant managers have found that many workers taken on at twice or thrice their pre-war wages would knock off one or two days a week because they preferred leisure and their ordinary incomes to full-time work at more money. Pitkin believes the desire for leisure is the reason why most people buy domestic labor-saving devices.

The author summarizes what he has tried to do in his study of the consumer as follows:

"We have tried to sketch the constellation of impulses which make up the behavior of the ordinary human being. His love of maximum variety, of getting something for nothing, of exerting himself only a little but often, of security toned up with a little speculation and adventure, of health, of social status, of self-respect, of freedom from onerous responsibilities, and of easy-going self-improvement—can all such dreams be realized in any single way of life half so well as in a home of his own, with his family around him? Certainly no genius has yet discovered another way. For it is the unique feature of the home and family system that, intelligently pursued, it satisfies most of the elemental cravings neatly."

The man who owns his own home makes the ideal consumer and a good citizen. "There is no end to improving a home, and never a chance of finishing with all the desires of a family."

Electric Kitchen & Air Conditioning Put in Low-Priced Home

WANTAGH, L. I.—First all-electric home to be offered in the New York metropolitan area within the price range of $5,000 to $10,000 was opened here recently. "Design No. 20" in the plans available under the General Electric "New American" home program, the house was conceived by Walker and Gillete of New York, and was built by Alfred L. Hart.

Year-'round air conditioning, centrally controlled oil furnace, complete electric kitchen, and modern wiring system, built in as part of the initial equipment, are features of the house, which is priced at $6,500, exclusive of the lot.

The home's air-conditioning system has been so engineered that its summer cooling system will condition the kitchen and living rooms by day, and the bedrooms by night, using smaller apparatus, and lowering operating costs.

The basic system controls the filtration, circulation, and humidity of air throughout the whole year.

Built on a 55 by 150 foot lot, the house is completely insulated with rock wool. The garage, located at the front facing the street, has a railed roof terrace, accessible from a stairway adjacent to the service entrance.

Similar houses are to be built by Mr. Hart in Queens, Nassau, and Suffolk counties.

Split-Up of Home Economics Division into Metropolitan and Wholesale Sections Helps Dealers Get New Prospects

NEWARK—Extra promotional activity is accomplished and new prospects are reached constantly by the P. H. Harrison Co.'s (General Electric distributor for northern New Jersey) split-up of its home service operation into two divisions—a metropolitan area activity directed by Mrs. Helene Foster, and a dealer and wholesale area activity directed by Miss Alice Woods.

Demonstrations on electric kitchens and laundry equipment conducted by Mrs. Foster at the R. H. Muir department store in East Orange, N. J., average about 15 each month and are planned for definite groups of clubs, churches, parent-teacher associations, scout mothers, sororities, etc.

These group demonstrations differ from the usual activity of this type, in that each group is paid $10 for an attendance of 25 to 30. In this way it is assured that every woman will remain throughout the entire time and will observe the whole demonstration. Groups are small enough to facilitate informal discussion and explanation.

On every second Wednesday of each month a refrigerator users' meeting is held at Muir's by Mrs. Foster. To each new purchaser of a refrigerator an invitation is issued for her to attend the user meeting and bring a friend. The company has found this meeting to be one of the best goodwill builders toward new sales it has yet found.

The distributor company has 10 complete G-E kitchens in the showrooms of its branches and dealers throughout the territory. Miss Alice Woods directs home service activities in these kitchens.

In addition to group demonstrations held along the same lines as those conducted by Mrs. Foster, Miss Woods conducts training schools for salesmen at scheduled times. She participates in newspaper cooking schools and cooperates with utilities in demonstration programs.

Another activity used by Miss Wood is the prospect luncheon. A new range user invites her friends to her home and Miss Woods prepares and cooks a luncheon. While the food is cooking, a sales story on the range is given.

Originally the home service department consisted of user and prospect meetings at the Newark showroom. Here a stage was erected in the Institute room, refrigerators were connected, and demonstration and lectures given from the platform. After the demonstration, bridge was played. Mrs. Foster sold refrigerator accessories at these meetings, which helped defray the operating cost of the department.

Visitors to Philadelphia Exposition Show Trend to Larger Refrigerators

PHILADELPHIA — Attention was concentrated on electric refrigerators at the eighth annual Radio & Electric Show held at Convention Hall here recently, states George R. Conover, exposition manager, with a decided trend toward the better grade, higher priced refrigerators noted. (See story on page 1 of Oct. 23 issue.)

C. K. West, president of the Electrical Association of Philadelphia, sponsor of the exhibition, said the affair was the most successful from the standpoint of total attendance and volume of sales since 1931. Approximately 121,000 persons attended during the six-day period, a gain of 21 per cent over other years.

Mr. West believes radio and electric dealers are more optimistic for the future since noting the interest shown in their products and the increased amount of buying.

In addition to refrigeration equipment, air-conditioning equipment and a completely electrified home were on display. The home showed the appliances necessary for kitchen, dining room, living room, bedroom, bathroom, nursery, garage, basement.

Features of the show included a series of cooking demonstrations, sponsored by the *Philadelphia Inquirer,* and conducted by Mrs. Anna B. Scott, home economist. About 7,000 women attended these meetings.

The "House of Magic," display sponsored by the General Electric Co., demonstrated products such as the stroboscope, the artificial fever machine, and demonstrations of the photo tube showing its possible applications in the fields of home, industry, and medical science.

Heading the list of entertainment features was the 60-piece symphony orchestra directed by Jess Altmiller, including vocal solos by Tilly Barmach, grand opera soprano, and Miss Jean McCool.

S-W Program Carried By 100 World Stations

CHICAGO—Approximately 100 stations on the World Broadcasting system now carry the Stewart-Warner message embodied in the series of 15 minute electrical transcriptions called the "All Star Radio Round-Up," recently released for S-W dealers' use.

Programs designed to meet many types of musical tastes are included in the series, and individual units have variety that combine recordings of outstanding orchestras, singers, operatic and symphonic selections, and star acts.

Incorporated into the programs are brief announcements concerning the features of the S-W radios. Intervals are provided for the announcements, special offers, and advertisements of the dealer sponsoring the broadcast.

Standard Stove Opens Chicago Showrooms

CHICAGO—Standard Electric Stove Co. has opened a display room and office at 1441 Merchandise Mart, in charge of W. H. Sickinger, district representative, M. E. Gelow of this company announced recently.

Display samples of representative models are installed and all transactions from the Chicago office will be handled in this new outlet.

Main office and factory of Standard Electric Stove Co. are located at Toledo. Other offices are: export office, New York City; central district office, Chicago; western office, Los Angeles. Mr. William P. Swartz heads the Los Angeles branch.

Tampa Frigidaire Dealers Plan Winter Program

TAMPA, Fla.—Fall and winter selling plans were outlined at the district meeting held here by the Byars-Forgy Refrigeration Co., local Frigidaire distributor.

P. H. Huston, southeastern zone manager, discussed the household division plans, and H. E. Warwick, sales manager for Byars-Forgy, outlined the commercial department plans. The meeting was attended by dealers and salesmen from cities and towns throughout the Tampa area.

G-E Reports Gain in Range Sales; Lists Users of New Imperial Model

CLEVELAND—Electric range sales by G-E dealers so far this year show an increase of 123 per cent over the same period last year, reports J. R. Poteat, manager of the electric range division of General Electric Co.'s specialty appliance department. Sales by the retail departments of distributors show an increase of 98 per cent.

"The higher increase in sales by dealers," says Poteat, "might be explained by the fact that electric range sales are higher in communities where people own their own homes and do their own housework.

"However, in the large cities electric cookery is becoming more and more popular. Our Imperial range, especially, is in demand. In recent weeks, the Imperial—highest priced of our range line—has gone into some of the finest homes of America.

"Among these homes are those of Edsel Ford of Ford Motor Co.; R. J. Reynolds, Jr., of the Reynolds tobacco company; W. A. Jones, executive vice president of Cities Service Co.; Dudley Golding, president, American Oil Co., Dallas; H. P. Baker, president, Massachusetts State College, Amherst; Lamott Dupont; Miss Ellen Pemberton, president, Wellesley College; L. R. Maxon, president, Maxon, Inc., Detroit; E. J. Bush, comptroller, P. Lorillard Co., New York; F. W. Packard, president, Packard-Bamberger Co., Hackensack, N. J.; S. F. Westbrook, vice president, Aetna Life Insurance Co., Hartford; W. T. Benning, treasurer, Southern Colorado Power Co., Pueblo; R. A. Boutwell, vice president, Hood Milk Co., Boston; Alex Rogers, publisher, *Lawrence Eagle-Tribune,* Lawrence, Mass.; H. B. Rising, treasurer, Whiting-Weeks and Knowles, investment brokers, Boston; Judge Geo. B. Weimer, Kalamazoo, Mich.; Geo. T. Mitchell, former state attorney, Tupelo, Miss.; former Lieutenant Governor Charles Lewis, Upper Sandusky, Ohio; W. J. Laube, Jr., Laube Interstate, Inc., Naugatuck, Conn.; John A. Seeger, chairman of the board of Seeger Refrigerator Co.; H. J. Grant, vice president, *Milwaukee Journal*; Allan J. Hill, vice president, Janney, Semple, Hill Co., Minneapolis; and George W. Trendle, manager of radio station WXYZ, Detroit."

8 Leonard Sales Made & 82 Prospects Listed After Movies

SANDUSKY, Mich.—Eight immediate sales of Leonard electric refrigerators and a list of 82 prospects from which sales are being made was the result of a Leonard film show sponsored by B. A. Pitcher, local Leonard dealer, recently.

Two showings were given, one in the afternoon and one in the evening, and the attendance was 275 women.

Prizes were awarded to the guests holding lucky-number tickets, and music was furnished during the program by the Sandusky High School orchestra. Two Leonard films were shown on the program.

700 G-E's Sold in 5 Years By Sell & Sons

PITTSBURGH, Kan.—Sale of approximately 700 G-E refrigerators over a period of five years is the record of Sell & Sons Mercantile Co., hardware store here, according to reports made by John Sell, head of the company.

This store has sold G-E refrigerators to more than 13 per cent of the domestic electric meters in this area.

Newspaper and direct mail advertising on electric appliances are used as promotion mediums together with cooking school programs.

78,343 Floor Cleaners Sold During September

CLEVELAND — Vacuum cleaner sales for the month of September, 1935, totaled 78,343 floor cleaners and 27,478 hand cleaners, reports E. Murray of the Vacuum Cleaners Manufacturers Association here.

Sales Idea of the Week

By V. E. (Sam) Vining, Director of Department Store Sales, Westinghouse Electric & Mfg. Co.

At the risk of offending the tender sensibilities of followers of true art, and arousing the ire of local boosters for rugged mountains or rolling plains, or what comes between them, I am going to talk about REAL beauty.

Close your eyes and with me dream.

Visualize, if the gods have blessed you with imagination—

—A platter, preferably blue; and on the platter an egg, fried 'til the edges curl into crispy amber troughs to hold the melted butter—the yolk a sun-kissed cap-sheaf on a mountain of snow; a volcanic crater ready to burst and spread golden lava over an unsuspecting countryside.

At the other end—

A mound of potatoes—each raw slice fried to delicious crispness.

And in between—

A smoking slice of ham spreading an aroma more alluring than ancient scents of the Nile, and the little bone winking at you through the haze, trying to tell you of the sweetness in store for you when, for a last dainty morsel, your tongue slips down and cups out the marrow.

Black pepper. Parsley. Toast from home-made bread.

That's beauty.

But—try and get it at "Sloppy Joe's Food Emporium."

The fruit of the hen and the hog, in the hands of an expert, are a gastronomic triumph; to Joe they are merely another order of "Ham-and," a slinky, slimy, crinkly, head-hanging concoction, swimming in a sea of grease, which reminds us that there must be a sales connection some place in this story—

Because—

Both Joe and the expert used the same tools and the same ingredients.

PERSONALITIES

By George F. Taubeneck

Why We Have No Pep This Week

By the time you have leafed through this far in today's ELECTRIC REFRIGERATION NEWS, you should be well acquainted with the fact that service men, parts jobbers, and parts manufacturers from all parts of the country were in Detroit last week, and that each group conferred on common problems.

Moreover, if you are the careful reader of the NEWS that most of you say you are—and seem to be, if we may judge by the thoroughgoing way in which you call minute errors to our attention—there isn't much more we can tell you about these meetings and what happened in them, for they are well covered in this issue.

On this page, and one pages 2, 14, and 16, is photographic evidence of the well-attended "party" at which Publisher F. M. COCKRELL and staff played host in the new home of the Business News Publishing Co.

Temprite and Larkin each supplied beer coolers and dispensers for the occasion, there was plenty of food for a buffet supper, and the various individuals—many of whom had been mutually suspicious and antagonistic before this occasion—became convivially acquainted, and discovered that perhaps they had been mistaken about that fellow being a so-and-so.

Wednesday night down at the Fort Shelby hotel there was an "exhibitors' frolic," for which the NEWS furnished an "act" consisting of "home talent" from the office force, and at which there was dancing, inspection of exhibits, and the customary libations.

* * *

Lost: Sentimental Chrome Cigarette Case

But, come to think of it, there is one piece of news with reference to the meetings which hasn't been mentioned elsewhere in the paper. Our good friend, GEORGE HOHNER, factory superintendent of Temprite Products Co., lost in the Fort Shelby hotel Wednesday night, Oct. 23, a valuable keepsake answering to the following description:

Ronson Combination Chrome Cigarette Case and Lighter, engraved "G. E. H."

It seems that this case was a gift from the loving wife of Mr. Hohner, and has unreplaceable sentimental value. Also, he'll probably catch hell if she discovers its disappearance; and its prolonged absence will test his versatility in thinking up new alibis.

So—will whoever found this case kindly return it post haste to Mr. Hohner? Also please, please don't mention the incident in front of Mrs. Hohner. This issue of the NEWS, it goes without saying, will not appear in the Hohner home.

Rival Twins

C. W. JOHNSON of the Virginia Smelting Co. viewing the famed Ansul Twins (who have become well-known in the industry through the cartoon copy advertisements published in ELECTRIC REFRIGERATION NEWS) at the Ansul exhibit at the R.S.E.S. convention, told H. V. HIGLEY, who heads the Ansul Co., that the "twins" idea should really belong to Virginia Smelting Co.

"We've got the original twins in this industry if anyone has," declared Mr. Johnson, "in A. H. EUSTIS and F. A. EUSTIS. (The Twin-Brothers Eustis are top executives of the Virginia Smelting Co.)

* * *

Legal Acceptance Of Trade Names

When a state legislature designates a class of taxable products by the trade names of two leading manufacturers, then those manufacturers surely must feel that their advertising departments have done a thorough job.

In "an act to amend Chapter 118, Laws of 1934, being the privilege tax law of the State of Mississippi" (see story on page 1) a long list of products, the merchandisers of which are to be taxable, appears. All sorts of products, like washing machines, office equipment, etc., are mentioned—each by product classification.

But when it comes to refrigerating machines, the bill says: "Kelvinators, Frigidaires, or refrigerating machines of any character operated by gas or electricity." In no other product classification does a trade name appear!

* * *

Dominic & Tony

MILDRED SCOTT of the Kelvinator Corp. of Boston tells us a little story which might well be called "Our Ice Man Doesn't Work Here Any More!"

It concerns a dealer, MR. DOMINIC LACENTRA of the Metropolitan Refrigeration Co., Boston, who through his Kelvinator effort has cut considerably into the business of one ANTONIO MALDERO, the one and only ice man covering the north end of Boston, an Italian section.

Since Jan. 1 of this year Mr. LaCentra has weaned away from Antonio 40 of his customers, and in all good friendly rivalry it has been accepted in that locality that some day Antonio would "get" Dominic.

However, it now develops that the tables have turned, and Dominic "got" Antonio.

Mr. Maldero took stock of his talents, his prospects, his vanishing clientele, etc. and accordingly called in Mr. LaCentra. The result was that on Oct. 21 a Super Deluxe Kelvinator model SD658 was installed in Mr. Maldero's home at 24 Sheafe St., Boston.

Foreign Notes

It won't be long—we hope—before this page will be entirely occupied by news, observations, and pictures gathered abroad.

Hence, it might be a good idea to get you-all accustomed to reading about How It's Done in Foreign Lands.

On the rest of the page are little stories told us by manufacturers about their export business. More will follow in subsequent issues.

* * *

Frigidaire First

JAMES W. "JIM" IRWIN, alert director of public relations for Frigidaire Corp., takes us to task for the statement in last week's column that the kerosene-operated Electrolux refrigerators which MR. AND MRS. MARTIN JOHNSON, famed jungle explorers, are taking with them on their trip to Borneo, marks the first time that they have carried modern refrigeration equipment on one of their expeditions.

"Two years ago," scolds Jim, "the Martin Johnsons took a Frigidaire ice maker with them on an expedition, and the fact was advertised extensively in Coca-Cola color advertisements on the back of the *Saturday Evening Post* and other national magazines.

"Furthermore," he shouts, "they're carrying another Frigidaire ice maker with them on their current trip."

* * *

Mr. Lindsay Returns

A. G. LINDSAY, manager of the foreign division of the Crosley Radio Corp. forsees good business in Europe in spite of the present turbulent conditions there. Mr. Lindsay has spent practically all of his life in the export business, and can tell you plenty about conditions which have prevailed in Europe for the last 25 years.

Recently Mr. Lindsay undertook another trip abroad in order to establish closer working cooperation with the companies distributing Crosley radios and Shelvador electric refrigerators in many countries, and also to study markets with a view to determining what new products would be suitable for the special requirements of various countries and localities.

Shortly after Mr. Lindsay's return, the writer interviewed him at the Crosley factory in Cincinnati (see picture on page 1 of Oct. 9 issue).

"The United Kingdom," he says, "is unquestionably the brightest spot on the map today. It is truly amazing how that country has worked itself out of its difficult economic situation. Business in England is very definitely booming.

"The radio industry in that country has never been in a sounder position than it has been this year, and one radio manufacturer in Manchester has had to secure permission from the Home Secretary to work full night shifts.

"Household electric refrigerators are beginning to be more widely appreciated by the British public, and substantially increased sales may be confidently expected from now henceforth.

"In France similar improvement in the refrigerator business can be anticipated, considering a growing interest in this modern convenience. It remains, however, to be seen just how successfully this interest can be translated into dollars and cents for the American exporter in view of the renewed difficulties, quotas, tariffs, etc. which the French government continues to place in the way of imports from America.

"In this connection it is interesting to observe evidence of a different trend—if we may consider as a straw in the wind the declarations made by Commerce Minister Bonnet of France before the Assembly in Geneva several weeks ago, bespeaking the reestablishment of stable exchanges and a general lowering of international trade business.

"American radios and refrigerators continue to be favorites in Spain; but there the American exporter has to contend with serious delays in the matter of receiving dollar exchange in payment for his goods.

"It is my opinion, that in spite of these exchange difficulties the Spanish financial structure is a sound one, taking into consideration that the metallic reserves of the Bank of Spain at the present rate of the peseta exchange represent nearly 100 per cent coverage.

"The bonded indebtedness of the country in proportion to its metallic holdings may be considered moderate and on the safe side, which would indicate that present exchange obstacles in Spain could be rather quickly eliminated by that country if its government decided to make use of its powerful gold and silver bullion reserves. Incidentally, the gold bullion of this reserve amounts to 85 per cent of the total."

As far North as Sweden Mr. Lindsay found a marked improvement in sales of electric refrigerators. He was particularly impressed with the fact that refrigerator sales there are continuing right into the cold season, and cited it as evidence that mechanical refrigeration is recognized as a year-'round necessity even in that cold northern country.

Mr. Lindsay spent some 10 days in Italy, visiting the important centers both in the North and South, including Rome and Naples. He declares that Crosley radios are among the three best sellers in that country.

In spite of any appearances to the contrary, Mr. Lindsay believes that the Italo-Ethiopian dispute will not lead to a conflict of arms between the European powers themselves.

"As far as I could gather from contacts with the public in the different countries I visited," he states, "there appeared everywhere to be the utmost opposition to any steps of their governments which might lead to military conflict.

"The European powers do not seem to be in agreement in regard to any uniform *application* of so-called sanctions against Italy, and under the circumstances it seems that it will hardly be likely that Great Britain will take it upon herself to apply any sanctions against Italy other than flexible sanctions of an economic nature which may always leave a back door open for adjustments somewhere."

* * *

Belgium Buys Beer

JOHN WYLLIE, Temprite sales manager (who lent us his camera for taking the pictures you see in this issue) tells us that Temprite Products Corp. has just received an order through Kelvinator Corp. from its distributor in Belgium, Etablts Dehaes, for 15 Temprite coolers, the order calling for 12 model S-50-B-4-W, two model S-25-B-3-W, and one model S-25-B-1 coolers.

HENRI DEHAES, son of the Belgium distributor, has recently been in Detroit for a visit, during which time he had several consultations with the executives of the Kelvinator and Temprite factories.

Etablts Dehaes has been Kelvinator distributor in Belgium for the last eight years.

The Dehaes organization was established more than 50 years ago by Mr. Dehaes' grandfather.

Originally an equipment supply house for butchers, the Dehaes company became Kelvinator distributor in 1927. Pierre Henri Dehaes started as a salesman with the firm, later became sales manager, and now directs the activities of the entire organization.

Mr. Dehaes reports that business in Belgium is fair, considering the generally unsettled conditions throughout Europe.

Mr. Dehaes sailed Oct. 9 from New York City on the much publicized *Normandie* for France, whence he will proceed to Belgium. Maybe we'll be seeing him.

* * *

Trousers Unimportant

London, England, always has set the style in clothes for men, so it is not surprising to learn of a recent contest conducted by Kelvinator, Ltd., of England in which the salesmen were given an opportunity to start from nothing and completely clothe themselves in a style approved by the newest London decree.

This "Dress Yourself" competition was held for three months, and was open to both domestic and commercial electric refrigeration salesmen. Quotas for commercial salesmen ranged from about $4,500 to $7,500 and for domestic from $2,500 to $5,000 for each man.

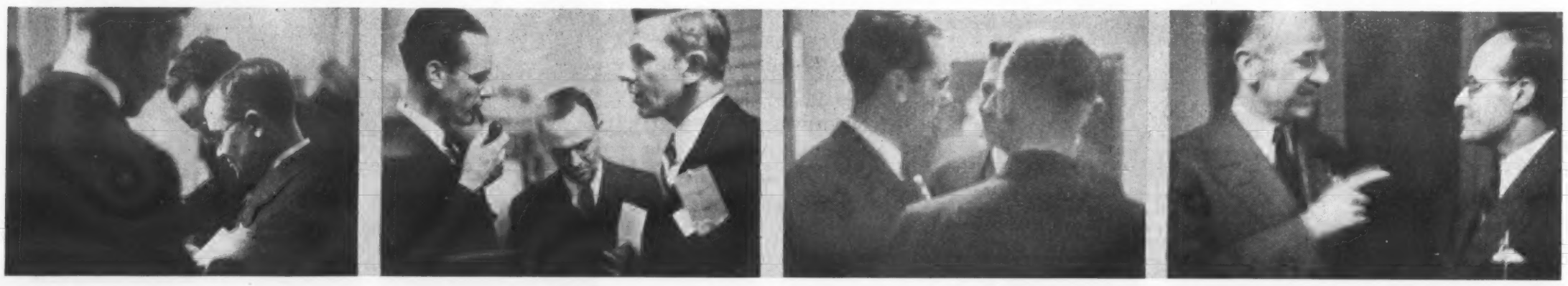
The entire sales force of Kelvinator, Ltd., started the three months' race "all undressed and lots of places to go" — figuratively speaking. Each salesman depended "upon percentage to obtain garments to cover our nakedness and, in time, allow us to parade that outward symbol of salesmanship—The Well Dressed Gent."

Socks, hat, gloves, and even warm underwear were relatively easy to obtain. It is interesting to note, however, that the English attain "respectability" by means of shirt, collar, and spats, which were next in order, while a pair of trousers added only "assurance," and were available only to the salesman with 100 per cent of quota.

Each Friday, the men were shown their relative states of dress or undress by means of a poster. New salesmen were indicated as babes in the nursery.

At the end of the contest, Salesman Green led the entire sales force with 120 per cent of quota and was fully clothed and carried a cane and a portfolio. Salesmen Dowsing, Noel, and Gunst finished with 100 per cent. Others ended the contest in varying stages of attire. None, however, had to wear a barrel.

Business Fellowships Formed and Cemented at Party Held in News Offices



More informal discussions between manufacturers and supply jobbers, at last week's "open house" meeting. (1) H. E. Adams, Lewis Supply Co., Memphis; Paul Penn, Penn Electric Switch Co., and another guest get together over a mutual problem. (2) "What I'd like to know is this . . ." Mr. Adams asks Mr. Penn. Other jobbers were asking and answering kindred questions. (3) The same two men, with a new third party in the circle. (4) "And here's something I want you to remember . . ." J. D. Merkel of Merkel Bros. Co., Cincinnati, is most emphatic.

Between meetings and eating, manufacturers and jobbers read the News—and not just to be polite, either. (1) J. D. Colyer, Wolverine Tube Co., reads excerpts from last week's editorial to Albert Duce, Steel Sales Corp., and H. W. Small, Thermal Service Co., Inc., St. Paul. (2) Mr. Colyer, W. C. Gernhart of Wolverine Tube, and Mr. Duce look over the industry's newspaper. (3) Accountant Roy Sharp, always a good checker, turned his talents from figures to fedoras last week. (4) Behind the scenes, our own Andy Gantt played a big part in the party's success.

EVAPORATORS

Bennett Tells How to Obtain Best Results in Modernizing 'Cold Rooms' with Fin Coils

By F. M. Bennett, Refrigeration Economics Co.

FINNED cooling coils used with gravity circulation or forced draft unit coolers have revolutionized refrigerating methods for small commercial installations. Their use in that field is universal. Liberal use of this low cost cooling surface has made possible refrigeration economies that were unheard of 10 years ago. In many cases the users of large refrigerating equipment still use the old style bare pipe coils in spite of the fact that they could reduce their refrigeration power cost by 25 to 50 per cent if they were to modernize their equipment, using finned coils.

Thousands of owners of old (and not so old) ammonia plants are paying excessive power bills every month and still they are getting poor refrigerating results. Humidities are too low and shrinkage losses high. Air circulation is impeded and slow and bacteria growth fast.

All of these plants are potential customers for modernization that will save them enough money on power alone to pay a handsome return on the necessary investment and at the same time improve their air conditions and refrigeration in general. In many cases the resulting increased cold storage space will, alone, justify the investment.

As an example, in two meat coolers that have been thus modernized, the net usable cold storage space has been increased over 25 per cent, humidity raised to 90 to 95 per cent and shrinkage loss reduced greatly.

Before modernization two 10-hp. refrigerating machines were used in hot weather; now only one is employed and it has been reduced to a 7½-h.p. load. The saving in power alone is paying for the improvements at the rate of about 50 per cent per year, and probably a true valuation of the advantages such as increased storage space, reduced shrinkage losses, and no defrosting labor would make the investment earn 100 per cent a year.

In a general cold storage room (Fig. 1) about 80x25x12 ft. installed in an old brewery building, the cooling surface was installed up between the ceiling beams in space otherwise unusable.

Cold storage costs 45 cents and up per cubic foot and in this case the saving in space alone went a long way towards paying for the improvement. Temperatures and humidity (90 to 95 per cent) are automatically controlled by a simple thermostat, back pressure valve and magnetic suction stop valve. Air circulation is perfect and there is no sweating of walls, ceiling or floor. A thermometer hung 12 in. directly below the cooling surface registers only 1½° F. lower than the warmest place in the room.

As the amount of air being circulated is inversely proportional to the temperature difference, these results show that unrestricted gravity circulation of this kind moves from three to ten times the amount of air as is circulating in rooms equipped with a coil bunker.

In one packing house sales cooler which we have equipped the room is cooled to 32 to 36° F. with the ammonia back pressure regulator set for an evaporator temperature of about 20° F.

The old coils in other parts of the plant necessitate a refrigerant temperature of —8° to 0° F.; say an average of —4° F. When the modernization of this plant is complete, refrigeration will be produced at 20° evaporator temperature at a power input of 21.8 kwh. per ton as compared to present conditions of 33.5 kwh. per ton: a saving of 35 per cent in power cost alone.

In this case, modernization in one room alone will make available, for another required cooler, the present coil loft, and the value of this space may conservatively be figured at $8,000 or over half the cost of modernization of the entire refrigerating system.

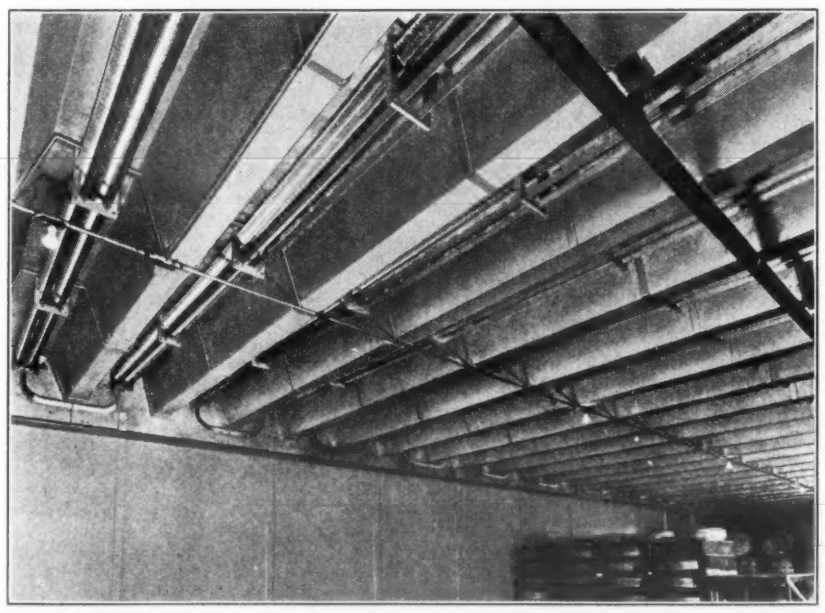
For best results finned cooling surface must be installed on ceilings and as the surface must defrost at regular intervals, some provision must be made to catch this water. All of the installations shown above use down draft systems. The fins are square, set on a 45° angle so that the water runs off of the point and drops into aluminum "V" troughs supported directly below the fin points. As these "V" troughs are narrow they offer practically no obstruction to the downward flow of the cold air.

The head room required for coils and down-draft system combined is about 8 in., so there is generally plenty of room for this type of cooling surface, as for instance between the meat rails in a meat cooler or chill room.

Best engineering practice is to install enough surface to do the work in about two-thirds operating time, allowing one-third of the time for safety and defrosting periods. A temperature difference of about 15° F. between room and refrigerant is recommended where high humidity is desired.

The coils are located close to the ceiling so that during the shut down period the warm air stratifies around the coils and defrosts them before temperature in the storage space rises excessively.

Unusable Space Made Usable



Modern refrigeration coils placed between beams in this cold storage room provided maximum conditions for the preservation of products.

G-E Uses Oil to Show How Unit Operates

CLEVELAND—Specialty appliance department of General Electric Co. has made available to dealers the "Monitor Top Oil Demonstrator" for display purposes.

In this display, the actual mechanism of a model CK refrigerating unit is used, and when connected to a convenience outlet, it operates as it does in the sealed Monitor Top. The unit is glass enclosed, permitting an open view to the mechanism and to the oil action in the refrigerating unit. A supply of oil is contained in the base of the model and the action of the oil during the operation of the unit is clearly visible through the glass dome.

Replacement Eliminated in Ice Tray Construction

Present-day construction of aluminum ice cube trays has eliminated most of the possibilities for replacement or repair, claim officials of the Aluminum Goods Mfg. Co., leaving only a few simple precautions to be taken for their proper operation.

Trays should be removed occasionally, cleaned to remove any deposits from the water, and then dried.

If pure aluminum trays are employed, any stains may be removed by boiling with some mildly acid substance such as tomatoes or a very weak solution of vinegar. This is seldom necessary with Alumilite finished parts, say Aluminum Goods Mfg. Co. officials, and should never be done except with decidedly weak solutions and only for a short time.

Another precaution regarding aluminum is not to place it in contact with a different metal, as an electrolytic action may be set up if there is moisture present.

EVAPORATORS

Operation of Kold-Hold Units & Remedies for Service Problems Outlined by Greenlee

DETROIT—How Kold-Hold cooling units operate in truck refrigeration systems, the proper practices to be observed in installing such units, and suggested remedies for possible service problems, were outlined by O. D. Greenlee, refrigeration engineer of the Kold-Hold Mfg. Co., in an address at the final technical session of the R.S.E.S. convention here last week.

"Truck refrigeration has long been a serious problem in itself but seldom has it received the benefit of careful study and analysis by those who were really competent to do a workmanlike job," said Mr. Greenlee. "The activities and resources of the leading refrigeration companies have been almost constantly absorbed by other interests which promised a greater volume of business. Consequently 'truck refrigeration' has been allowed to grow up more or less like the well known Topsy.

"Some of the first attempts at mechanical refrigeration for trucks were pretty sorry affairs. They were bulky, heavy, costly to install, and expensive to operate and seldom dependable, even if they furnished the results for which they were designed. Naturally, if a truck is to be mechanically refrigerated, as we understand the term, a compressor must be employed.

Compressor Drives

"Original attempts to drive the compressor took many forms. Gasoline engines were and still are used. In all fairness we must acknowledge that the manufacturers of this kind of equipment have made great improvements. As far as Kold-Hold is concerned, there are many applications where power to drive a compressor while enroute, is an absolute necessity. The same may be said generally of some types of power take-off and driven generators of sufficient capacity to furnish suitable electric current for a condensing unit motor.

Nevertheless, some of the first systems were so discouraging in the results produced that mechanical refrigeration for trucks went through a definite slump. We are just beginning to come out of it. A few compressor manufacturers are offering machines especially designed for truck application.

More than One Unit Installed

A Kold-Hold system installed in a truck, Mr. Greenlee, explained, consists of a number of "units" installed in a suitable position. The number of these "units" necessary for any particular truck body depends upon the individual requirements and is established by a process which I shall describe later. The "units" are sometimes referred to as "tanks" or "pads." The standard model used most extensively is 54 in. long by 24 in. wide by approximately 2¼ in. thick.

A Kold-Hold cooling unit, he said, may be described as a metal container with a large amount of effective cooling area, having within its walls or sides, an evaporator coil of improved and efficient design, the latter being surrounded by a known quantity of eutectic solution. This solution has a predetermined freezing and melting point (which is constant) and it has a known latent heat of fusion. Therefore, it is possible to calculate very accurately the refrigerating effect under varying conditions.

Nature of Solution

Kold-Hold units, (after the solution within them has been solidified by the operation of an ordinary compressor) remain cold enough, long enough, to provide the necessary refrigerating effect throughout the period of service without further mechanical operation.

The Kold-Hold units are charged or frozen at night while the truck is idle. Thus, only one operating period is necessary.

The eutetctic solution which is used is known as a true cryohydrate. A cryohydrate is a solid substance which will absorb a large amount of heat while passing from the solid to the liquid state, the temperature remaining constant during the entire period of melting.

"This reference is cryohydrates may sound rather involved and mysterious but we are chiefly concerned with the results," Mr. Greenlee stated. You are all familiar with ordinary water ice. When ice melts it passes through its latent heat stage, it absorbs 144 B.t.u.'s per pound without any change in its temperature of 32° F. When water freezes, it again passes through a latent heat stage only this time in the reverse order. It must give up 140 B.t.u.'s per pound without any change in its temperature of 32°.

How It Works

"The same process takes place in the Kold-Hold units, with this difference. The freezing and melting temperature, while constant, is at a much lower point. We have several solutions having different freezing points and these are utilized on various types of applications. Thus, you can see that our system merely consists of a fixed or effective cooling area in the form of Kold-Hold units which remain at a constant temperature throughout the period of service.

"Simple as this method of refrigeration is, there are still many important factors to be taken into consideration when recommending equipment and guaranteeing performance. No matter what kind of a refrigerating system we may choose for an example you know from your own experience that it can become a complete failure if not engineered properly throughout. The same thing is true if a system is not installed and adjusted in accordance with the results that are to be expected.

"We have endeavored to supply information and instructions with every sale of our equipment and it is our firm belief that no trouble will be experienced if our instructions and comments are followed with any degree of accuracy.

Location of Units

"The units themselves may be located in almost any position within a truck body. Of course we furnish diagrams and sketches showing the manner in which they are mounted. They may be placed either in a vertical position or in a horizontal position suspended from the ceiling of the refrigerated compartment or a combination of both of these may be used.

"Of extreme importance is the matter of adequate circulation of the air within any refrigerated space. This is something that deserves a little extra comment at this time and I will try to describe briefly some of the difficulties that we have experienced due to the Kold-Hold units being blanketed or prevented from functioning as they should due to lack of circulation.

Removal of Frost

"You all know what happens when a finned evaporator, or even a plain coil, becomes thickly coated with frost. Convection currents of air are reduced and the effect is the same as insulating the cooling coil. Frost will gradually build up if not brushed off regularly. Poor results are to be expected and often the Kold-Hold system or the condensing unit is blamed. The frost may be removed easily if done periodically and a good stiff brush is usually the only tool needed.

"Sometimes the units are installed too close to walls or partitions. Again the product such as ice cream, is loaded directly against the unit surface. In one instance I know of, a vertical Kold-Hold unit was mounted right in contact with a longitudinal structural member of the side wall about the center of the unit. The effect was almost the same as cutting the effective cooling area in half. That is, for that particular unit only.

Air-Cooled Condenser a Problem

"While we are on the subject of air circulation," the speaker continued, "we might as well say something about air-cooled condensing units. If a compressor is mounted on a truck there should be plenty of clearance for the condenser. The machine is necessarily enclosed and often it is difficult to arrange for sufficient cooling air. Supporting members of the truck body are often in the way and disturb the effect of the fan to a great extent.

"Sometimes condensers are within one or two inches of a solid blank wall. Naturally, such a condition will raise the head pressure and seriously reduce the capacity of the machine.

Care Needed in Tubing Installation

"With reference to the refrigerant lines or tubing, the same general practices used in any installation may be followed. A truck installation, if anything, should be made more carefully than any other. Vibration is a factor. Leaks are hard to find and hard to repair. Some prefer flared tube fittings while others prefer the streamline type. In either case it is a question of doing the job in a workmanlike manner.

"We furnish several accessories that are somewhat different than those with which you are familiar. One is known as the Heat Exchanger-Accumulator. It is a device which functions as an ordinary heat exchanger and at the same time prevents any heavy return of raw liquid to the crankcase.

Heat Exchanger Accumulator

"It consists of a seamless shell 15 in. long and 3½ in. in diameter, with a header and connections at each end. Inside this shell is a coiled tube connected to an inlet and outlet in the headers. Thus the shell becomes a part of the suction line, while the coil within it becomes a part of the liquid line. Inside the shell and connected to the suction outlet is a small device that gradually returns to the crank case any oil that may be trapped within the shell.

"While on the subject of installations there are a number of things to be said in connection with expansion valves. We keep in stock a number of thermostatic expansion valves for use with the various kinds of refrigerants that are used in truck installations. Valves are supplied or furnished with a 100-in. capillary line to the thermostatic bulb.

"A long capillary line is necessary in a great many installations due to the arrangement of the cooling coils within the interior of the truck body. Installation and service manual offers complete instructions as to the manner of installing and adjusting the valve, but nevertheless our recommendations are often ignored in this respect, and the result may be inefficient operation or complete failure of the job to perform.

Dryer Coil Recommended

"When an installation is made in a meat cooler, or some other refrigerated fixture consisting of a direct expansion coil and a thermostatic expansion valve to regulate the flow of the refrigerant, it is customary to employ what is known as a 'dryer coil' or at least an added length of suction line which will permit the liquid refrigerant to evaporate after passing the point at which the thermostatic expansion valve bulb is in contact. This is a reasonable practice and should be followed in truck installations as well.

"There are two things in particular that I want to bring out in connection with installing these types of valves. The first is the necessity for keeping the capillary line away from any other refrigerant line that will effect the operation of the power element. On a number of installations we have found that the capillary line was even taped directly to the suction line and of course the result was that the valve had to operate as a straight expansion valve. In other cases the capillary line was led through the same hole and in contact with the low pressure refrigerant line between the expansion valve itself and the cooling units.

"Another important point is the location of the bulb and its relation to the suction line. In lots of installations the expansion valve bulb has been placed at a reasonable distance from the outlet and the last coil in the series, but on a suction line that is in a vertical position and only a few feet from the crankcase of the compressor. In an installation of this sort the power element is not permitted to regulate the flow of the refrigerant efficiently and the result is that raw liquid is spilled into the accumulator which may become filled up and then sent on into the crankcase where oil and liquid slugging occur.

Horizontal Installation

"In other instances the bulb may be installed on a horizontal line when the distance between the bulb and the crankcase is still only a few feet. It must be remembered that on a truck body carrying its own condensing unit, the whole system is very compact and the low side and the high side are often in close proximity to each other.

"It is not a difficult matter to adjust an expansion valve correctly but here again instructions are often ignored. The installation man is usually a pretty busy person and seldom cares to spend any time with a job after it has once been started up. However, the initial pull-down of a system employing Kold-Hold units is bound to be a good deal slower than in conventional systems employing expansion coils, therefore, it is not advisable to make final adjustments until the pull-down is completed."

Why Pull-Down Is Slower

The initial pull-down, explained Mr. Greenlee, is something that has baffled many good service men because they cannot understand why, after the temperature begins to drop, it does not continue to do so, but seems to level off and remain more or less constant. This is perfectly natural and exactly as it should be, but sometimes a man will begin to make frantic adjustments and often he has the system so thoroughly upset by the time he is through that it is difficult to get things straightened out properly.

Mr. Greenlee elaborated on this point, saying: "I think everyone of you have seen a diagram of the process of freezing ice. If we consider a chart drawn on a time-temperature basis we can very clearly understand what takes place. For example, we may have a quantity of water at room temperature, say 70°. We will put a refrigerating coil in this tank of water and start the compressor. The temperature of the water will come down fairly rapidly to 32° F. and there it stops. The compressor is still running and the minutes or hours are still passing by.

"What is happening? The ice is freezing at a constant temperature of 32°. You have to remove 144 B.t.u.'s per pound from all of that water before it becomes a solid piece of ice at the same temperature. When this imaginative body of water becomes completely solid at 32°, then only can the operation of the compressor and cooling effect of the coil reduce its temperature further.

"This is exactly the same thing that takes place within a Kold-Hold cooling unit. It is during this period of the removal of the latent heat that the most satisfactory adjustments can be made. The reason for this is easy to understand. It is the point at which most of the operation of the condensing unit will take place. The back pressures and refrigerant temperature must be maintained within a range that will permit the removal of heat with the utmost efficiency.

"There is one more point that should be brought out while we are on the subject of the actual installation itself, and that is, inspection. How many of you have seen an installation man finish up a sulphur dioxide job, open up the valves, hastily sniff in the neighborhood of joints and connections and then pull the switch. After a truck job is completed it should be carefully tested for leaks no matter what kind of refrigerant is used.

Detecting Equipment

"Fortunately, we have much better detecting equipment today than we had two or three years ago. It's a good thing to come back after the job has been operating two or three days and give it a good going over once more. In this way it is possible to find something that may have been overlooked in the first place, but probably the best reason is the effect of confidence that will be placed in the installation man and the equipment he has installed, by the user himself."

There is no reason why a good independent service organization cannot take care of this work to the entire satisfaction of all concerned. The only prerequisite is a careful and conscientious man who will follow the instructions furnished by us and who has the background and experience necessary to understand the job he is doing.

Main Types of Service Calls

The great majority of service calls on Kold-Hold units, said Mr. Greenlee, may be traced to three main items; shortage of gas, improper adjustment (of thermostatic expansion valves,) and the accumulation of excessive frost on the cooling surfaces.

"We have run across several instances," he declared, "where a service man has repeatedly charged the system with gas and all he did to correct the trouble was wonder where the gas was going. Why didn't he find the leak and fix it? These are not small leaks either. Some of them have lost as much as 50 or 60 pounds of refrigerant in a few weeks time.

"Thermostatic expansion valves are often the cause for service complaints in Kold-Hold installations. The strainers may become partially plugged, the valve needle or the valve seat may become damaged or corroded and sometimes a deposit is even formed on these parts. Again, the power element may lose its charge or the capillary lines break away from the bulb due to excessive vibration, which usually may be prevented at the outset if all lines and other parts are rigidly mounted. One of the most frequent service calls is the result of moisture accumulations freezing at the expansion valve.

Moisture a Factor

"Sometimes a system has so much moisture that an ordinary dryer will not absorb the water vapor from the refrigerant rapidly enough to stop the trouble. In such an event it is well to use a larger dryer, permitting it to remain in the system only long enough to pick up the water through several complete cycles of the refrigerant. It is hardly necessary to go into the subject of dryers extensively at this time as most of you are entirely familiar with their various applications and the results that are to be expected when various kinds of drying agents are used.

"In speaking of air circulation, I mentioned the importance of removing frost from Kold-Hold units regularly. Hardly any more need be said along this line because any good refrigeration man can tell at a glance whether or not the frost accumulation is responsible for unsatisfactory service. Many ice cream manufacturers are too busy to pay any attention to their trucks during the peak season in hot weather and it is at that time that the utmost in efficiency is required of the Kold-Hold system. Also, it is during the worst kind of weather that the doors are opened the longest and naturally frost accumulates more rapidly.

"Of course, if frost is allowed to remain long enough on any cooling unit, it will gradually turn into solid ice and in the case of one of our units in an ice cream truck, it is very difficult to remove. Sometimes users will permit this ice to accumulate until it is more than an inch thick and even go so far as to plug up the spaces necessary for air circulation."

Askin Describes Fixture for Servicing Float and Header Assemblies

By Joe Askin, Chief Engineer, Fedders Mfg. Co.

The thousands upon thousands of flooded units in the field have resulted in a certain amount of service, and this in turn, resulted in a demand for a simple and inexpensive test fixture.

Such a test fixture may be constructed very easily from a scrap cooling unit by sawing off the upper portion of the cylinder and soldering a drain valve to the rear bottom of the cylinder. This fixture is illustrated in Fig. 1.

Fig. 2 shows a cartridge needle, for which a leak test may be made as shown in Fig. 1.

Fig. 3 shows a float and header assembly for methyl chloride.

For testing a methyl chloride float and header assembly, use a mixture of 50 per cent oil and 50 per cent Solvasol, Deo-Base, or kerosene.

For testing a Freon or sulphur dioxide float and header assembly, use carbon tetrachloride.

The above solutions are suggested inasmuch as they have a specific gravity close to that of the refrigerant used.

To test the buoyancy of a float and header assembly, use a good cartridge needle in the test. Assemble the float and header assembly in the fixture as shown in Fig. 4. Then assemble the cartridge needle as shown in Fig. 5.

Connect an air line having from 50 to 75 lbs. gauge pressure to the lower valve. Apply the air pressure and pour in the fluid as shown in Fig. 1. The liquid level should be about at the center line of the float when the air bubbles cease. Should a re-check be desired, drain some of the liquid off through the pet cock as shown in Fig. 6 and repeat test.

To check a cartridge needle, an illustration of which is shown in Fig. 2, place the cartridge in a float and header assembly, the condition of which is known to be O.K., and assemble into the fixture. Pour in fluid of the type recommended for that particular float and header assembly and continue pouring until the air bubbles cease.

Should the liquid level be considerably higher than the center line of the ball float, it is an indication that the cartridge needle is too short. Frost back is likely to result if this cartridge needle assembly were to be used in an installation.

Should the air bubbles continue to come even after the float ball has become submerged in liquid, it is an indication that the needle leaks badly.

A cartridge needle which is satisfactory will give a liquid level approximately at the center of the ball float with no air bubbles or only an occasional bubble coming to the surface.

Fixture for Servicing Float Assemblies & Cartridge Needles

Fig. 1—Conducting a leak test for a cartridge needle, with a test fixture made from a scrap cooling unit.

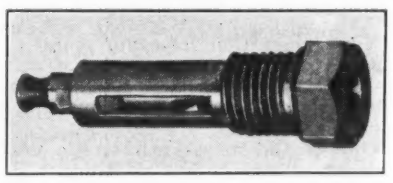


Fig. 2—Typical cartridge needle, on which such a test as shown in Fig. 1 would be made.

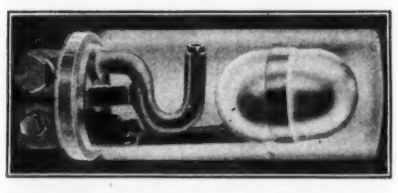


Fig. 3—Float and header assembly for a refrigeration system employing methyl chloride.

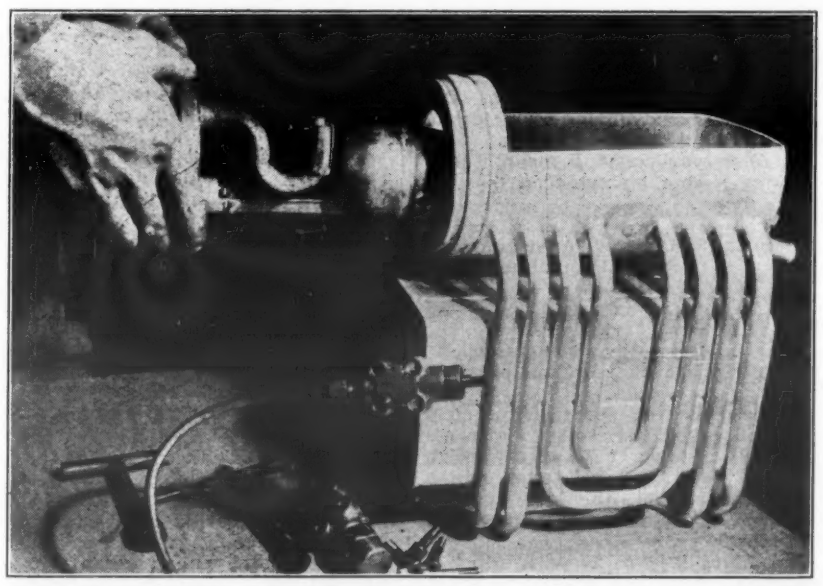


Fig. 4—Method of assembling the float and header assembly in the text fixture to test the buoyancy of the float and header assembly.

Fig. 5—Assembly of the cartridge needle for the test described in Fig. 4.

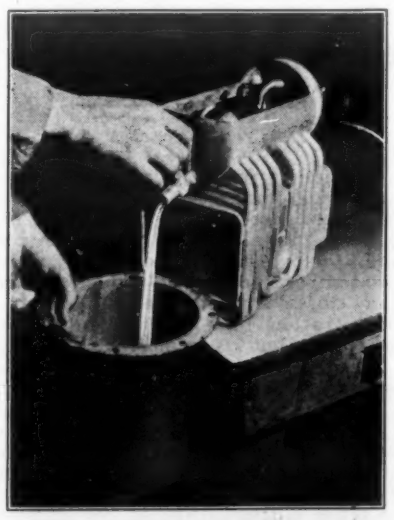


Fig. 6—Where a re-check is desired, some of the liquid should be drained off and test repeated.

Standardized Disseminator Plan Recommended By Larkin as Remedy for Baffling and Air Circulation Problems in Coolers

By Lester U. Larkin, Larkin Refrigerating Corp.

CONSTANT study and research over a period of years has proven to us time and again that one of the greatest problems of the service and sales departments is the uncertainty as to what speed of air circulation will be encountered in an installation, with the result that it is extremely difficult to accurately determine just what capacity any given coil or condensing unit will have since the capacity of both the coil and condensing unit are dependent upon the operating suction pressures; and the suction pressures are dependent upon the speed of air circulation over the coil surface.

In 1931 we developed a disseminator pan which was constructed of Z-shaped louvers positioned in a drain header, these members overlapping each other and placed at a 45° angle parallel with each other, and placed as far apart as possible still permitting the condensate to drip from the coil and be caught by the louvers collectively.

On our first test of this pan it was discovered that excellent circulation was obtained, but that by having a relatively small coil in metal contacts with the louvers, condensation would form on the back of bottom side of the louvers and drip onto the products.

However, constant study of this problem taught us that it was necessary to employ an amount of coil surface above the pan sufficient to result in a minimum difference between the pan and the coil, at the same time hanging coil and pan with separate hangers so that there is no metal contact between the pan and coil. The pan hangers are adjustable so that they can be utilized in all installations and adapted to varying conditions.

To review what this pan can mean to the industry as a whole let's analyze it from existing conditions. Practically all case and cooler manufacturers at the present time are well informed as to just what constitutes good baffling and in the great majority of cases good baffling is installed by the manufacturer.

But only too often we find that the product stored in the case or cooler is so located as to obstruct the free flow of air through either the warm or cold air ducts. Sometimes a cooler is demanded of the manufacturer with limitations as to head room, so that it is impossible for that manufacturer to arrange baffling as he knows it should be arranged because of these limitations.

Another instance which makes the baffling problem a difficult one to the case manufacturer is that he cannot be advised in advance whether or not that particular case or cooler is to be used with ice or mechanical refrigeration. He, therefore, must in many instances construct baffles that can be used with ice which further limits his possibility of installing a type of baffle which he knows would be better for electric refrigeration.

One advantage that may be obtained by standardizing and stabilizing baffling is that it would permit the manufacturer of thermostatic valves to construct his valves without adjustment, since he could definitely determine the superheat required.

A disseminator pan would accomplish this standardization because of the fact that all pans would be identical as to the pitch of the louvers and the amount of space for air flow.

The condition would be constant regardless of whether or not the pan was to be installed in a walk-in cooler, a pantry box, or a display case.

Replacement Gaskets Listed by Victor

CHICAGO—Compiled as a handy reference for purchasers of refrigerator replacement gaskets, the Victor Mfg. & Gasket Co. here recently issued a gasket guide which lists refrigerator manufacturers' part numbers, a description of each gasket number, and the corresponding Victor number for each gasket.

The 75-page book is arranged alphabetically and the index shows both the trade name and the name of the manufacturer.

Gasket items listed in the guide are, for the most part, designed by the manufacturers and made to their specifications.

Precautions Necessary in Using Leak Detector

A leak detector should always be pumped up, primed, and lighted before being brought into a building or room where a gas leak is suspected, caution the manufacturers of the Hull leak detector torch.

The space under test, it is said, should be well ventilated to reduce the concentration of any gases below the danger point, as various chlorinated compounds are more or less toxic or inflammable.

Hull officials recommend that clean, denatured alcohol, or preferably dehydrated methenol, be used for fuel.

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'Legitimate' Jobbers

FOLLOWING the editorial in the last issue of ELECTRIC REFRIGERATION NEWS, in which the rise of the independent service man to a position of prominence *and acceptance* in the refrigeration industry was traced and evaluated, perhaps it should be noted on this page that concurrently with the growth of independent service companies there has sprung up a group of suppliers to this new branch of the industry, known as "replacement parts jobbers." These local "jobbers" are just beginning to attain a "group consciousness," and last week convened for their first meeting here in the offices of the NEWS.

Early last summer the writer began having some correspondence with J. S. Forbes, treasurer of the Kerotest Mfg. Co., in an attempt to classify the constituency of this new branch of the refrigeration industry, and to define the functions of individual members. Wrote Mr. Forbes:

Problems of Common Interest

"Promptly upon receipt of your letter, I decided to communicate with four of our direct factory representatives who have had more experience in actual jobber and customer contact than almost any of the accessories men of which I know. I had them outline to me what in their opinion were the essential qualifications of a stocking jobber of refrigeration accessories, and also a brief dissertation on the future of a jobber of refrigeration accessories.

"I have harbored the opinion for some time that manufacturers of refrigeration accessories, including those who make valves, fittings, etc., like ourselves, have a common problem. I gained this opinion from meeting sales executives of non-competing companies; and invariably our discussion centers around problems that are of mutual interest."

That this consciousness of a need for the welding together of these jobbers was growing among the manufacturers of parts and supplies was further indicated when J. D. Colyer of Wolverine Tube Co. began conferring with F. M. Cockrell with regard to helping the jobbers form an association. Irving Knudsen of Detroit Lubricator Co., Morrill Dunn of McCord Radiator & Mfg. Co., and Frank B. Riley of American Injector Co., and others joined the discussions.

Two Groups Accept Invitation

Mr. Cockrell offered the office facilities of the Business News Publishing Co. for the first meeting of the jobbers, and a meeting of parts manufacturers, both of which groups accepted the invitation, and gathered in Detroit concurrently with the convention of the Refrigeration Service Engineers Society.

As is the case with so many associations of business competitors, it seemed that one of the first purposes of a jobbers' organization was that of keeping somebody from doing something. Disparity between price quotations of various jobbers has been quite noticeable, and as could be expected in such a situation, many jobbers have been worried about it. Hence there has been an agitation, first of all, for a definition of a "legitimate" jobber.

First Task: 'Define a Jobber'

The jobbers themselves did not arrive at any such definition, although it was the chief topic of discussion for the two days of their meeting. Parts manufacturers, however, did frame a definition of a jobber—which is at least a long step in the direction of the unity which these new factors in the refrigeration industry are seeking. This definition follows:

"The definition of a refrigeration supplies jobber or wholesaler hereinafter defined does not include the type of distributor who is recognized by some manufacturers as national or territorial sales-agents. It is recommended, however, that these so-called sales-agents restrict their sales at wholesale prices to those concerns who conform to the following definition of a refrigeration supplies jobber.

"In the following definition the term 'trade' is defined as including the following:

"1. Refrigeration Serviceman.
"2. Refrigeration Dealer.
"3. Refrigeration Distributor.
"4. Refrigeration Wholesaler.
"5. Refrigeration Contractor.
"6. Ice Cream Manufacturer.

Functions of the Supply Jobber

"The term 'Refrigeration Supplies Jobber' is defined to mean anyone performing the following functions hereinafter mentioned, and who does no retail service work for consumers, but may do service work for the trade on a wholesale basis. Provided, however, such jobber does not perform such wholesale functions merely to secure wholesale prices for the benefit of allied persons, firms, or corporations.

"A jobber should perform the following functions:

"1. Purchase at wholesale prices at least five different essential products necessary to supply adequately the requirements of the trade.

"2. Maintain and warehouse a stock of such products to supply adequately the requirements of the trade.

"3. Distribute to the trade only a catalog, either of his own or an aggregation of his manufacturers' catalogs. In case of a catalog of his own, the manufacturer should have the privilege of editing those pages or parts of pages covering his particular products."

Serving the Service Man

The business of *manufacturing* refrigeration parts, materials, and supplies has been recognized for some time as a definite and necessary sector of the industry circle, since the manufacturers of complete systems find it economic to purchase a great many component parts from outside specialists.

The independent service man (or company) has not been given much encouragement by the manufacturers of complete systems, but the manufacturers of *parts* see no reason why the independent service man should not be able to buy the supplies he needs to take care of his customers.

It is obviously impractical, however, for the manufacturer of parts to do business directly with thousands of service men scattered over the country. The service man needs *quick delivery* on *small quantities* of a *great variety* of items. The economic function of the local jobber becomes apparent at once.

Thus it happens that the jobbers have "recognized" the service man and set up local stocks to meet his needs. The manufacturers of parts have, in turn, "recognized" the jobber because he represents a buyer of substantial volume.

The meetings held at the home of the NEWS last week offered an opportunity for the groups to get acquainted with each other and set up some definitions. The representative attendance, serious interest, orderly procedure, and constructive work done, all indicate that a step forward of considerable importance in the development of the industry has been accomplished.

LETTERS

Untimely Illness

Henry V. Dick & Co.
Refrigeration and Bottlers' Supplies
514-516 Oates St., Charlotte, N. C.

Publisher:

I certainly regret that I was unable to be in attendance at your refrigeration parts jobbers meeting Thursday afternoon. I arrived in Detroit all right, but almost upon my arrival there, Mrs. Dick, who accompanied me to your city, became suddenly ill and I was unable to leave her.

Late in the evening I went out to the meeting, which apparently was over and not being able to find you I hesitated to linger away long, because it was necessary that I return to the hotel at once.

Naturally, this was quite disappointing to me, having driven 800 miles and after reaching your city not to be able to attend the meetings and take part in those things which I had planned to do, but at the same time I certainly appreciate your invitation and I feel that you have started the most worthwhile movement amongst the jobbers that we have ever witnessed, and I trust that in the near future I will have the opportunity to render what support I may and give of my efforts to assist in the building up of an organization which will further the aims and purposes of the refrigeration jobbers of this country.

HENRY V. DICK,
Manager.

Camera Idea Spreads

Kelvinator Corp.
Detroit

Editor:

Your operation of your eagle-eye camera during the past year or more is directly responsible for the idea being picked up by some members of our organization.

One of the most enthusiastic users of such a camera is Cal Mitchell, our district manager for the Carolinas.

A. H. REINACH
Manager of Kelvinator's standard commercial department.

It has gotten to a point now that whenever Cal comes in from the territory everybody hides under desks and places till he goes again.

To show you what I mean I am enclosing a shot he made on his last trip in here.

W. E. SAYLOR,
Operations Manager, Advertising & Sales Promotion Dept.

Last Word in Statistics

Charles Blum Advertising Corp.
1120 Spruce St., Philadelphia

Editor:

We happened to see today a copy of a book called REFRIGERATION AND AIR CONDITIONING MARKET DATA of which you are the publisher, and which seems to us about the last word in statistical information regarding these industries.

We would like to have a copy of this book, and if you will let us know what the cost is, we will gladly send you a remittance immediately so that we may have this at hand for reference.

E. A. MCCAY.

Attention: Valve Makers!

Walter Connally & Co.
Machinery
Tyler, Texas

Editor:

We are trying to find a manufacturer who makes a thermostatically controlled two-temperature valve. By this, we mean a valve that is made like the original snap-action type of two-temperature valve which opens and closes the suction line on the refrigeration machine at certain pressures but is controlled by the temperature of the coil on which it is operated instead of the pressure.

In other words, we are looking for a valve that will close and open the suction line at certain definite temperatures. We know, of course, one way to obtain this type of control is to place a thermostat in conjunction with a solenoid valve.

Any information regarding the above will be appreciated.

LEON H. MADDOX.

Another Customer

459 Stiles St.
Winnipeg, Manitoba, Canada

Editor:

Attached please find my subscription to ELECTRIC REFRIGERATION NEWS for one year.

Would it be possible through your connection with the refrigeration trades, to contact me with manufacturers of various parts of refrigerators with a view to buying in a stock of various parts?

JAMES GIBSON,
Electric Refrigeration Mechanic.

Better Understanding

Kerotest Mfg. Co.
2525 Liberty Ave., Pittsburgh

Publisher:

We wish to take this opportunity to congratulate you on the masterful handling of refrigeration parts manufacturers and jobbers groups which met at the home of the ELECTRIC REFRIGERATION NEWS last Wednesday. We feel that considerable good has been accomplished for all concerned and that the business was expeditiously transacted and thereafter a good time was had by all present.

It is obvious that the joint meeting helped to promote a better understanding between the rapidly growing group of refrigeration supply jobbers and parts manufacturers. Definite progress has been made toward a solution of the confusion that has existed since the birth of this industry, especially since the country has become "refrigeration jobber conscious."

J. S. FORBES, Treasurer.

Meeting of Minds

Victor Mfg. & Gasket Co.
5750 Roosevelt Rd., Chicago

Publisher:

May the writer take this opportunity of expressing his appreciation for the courtesies extended to him during his recent visit to your plant, in conjunction with the recent refrigeration convention.

Your very splendid cooperation in affording an opportunity and place for the meeting of minds between the jobbers and manufacturers was, undoubtedly, the outstanding element in the smoothness with which this coordination was accomplished and I am sure all others in attendance share this same feeling.

I am happy to have had the privilege of making your acquaintance.

EDW. GAMMIE,
Manager, Industrial Division.

Thanks

Refrigeration Economics Co.
1232 Second St., N. E., Canton, Ohio

Editor:

The writer wishes to take this occasion to thank your organization for the recent courtesies and entertainment.

F. M. BENNETT.

Advice on Schools

Brooklyn, N. Y.

Editor:

I need advice badly. I want to register at some refrigeration school that gives a good enough practical course to assure me of placement after I've finished.

I am a caster at present but must change my trade because it is very unhealthy. I want to pursue some training evenings that I can depend upon for results.

I write you because I believe you are most capable of giving such advice. Hoping to hear from you.

DAVID WONSEVER.

Answer: See advertisement on page 16 of this issue.

Wants Oil Heater

Byck Electric Co., Inc.
Savannah, Ga.

Editor:

We are interested in obtaining the distributorship for a good circulating oil heater, and will appreciate if you will put this request in the hands of the proper party.

S. M. BYCK.

No Can Do

Thomas Devlin Mfg. Co.
Burlington, N. J.

Editor:

We shall appreciate it very much if you can let us have annual sales figures of the leading mechanical refrigerator manufacturers for the past year or two.

PAUL C. BUNKER.

"Enclosed please find money order for $3.00 to cover a year's subscription to your paper. Please mail me description and price of your books on refrigeration. I saw a copy of your paper and think you are doing a good job in your coverage of the various problems facing the installation engineer."—J. W. Peacock, 5322 Sierra Villa Drive, Los Angeles.

"Enclosed please find three $1.00 bills. In season or out, the ELECTRIC REFRIGERATION NEWS is the one item that we are always waiting for."—W. Rene, Webster Refrigeration Service Co., 856 Marshall Ave., Webster Groves, Mo.

EVAPORATORS

Riley Relates Development of Oil Separators & Explains Their Operation

By Frank Riley, Riley Engineering Corp.*

IN the development of various types of evaporators almost as much time and effort has been spent in devising means for returning oil from the evaporator as has been expended in the development of the compressor itself.

Oil traps were invariably used in connection with all large commercial machines and in all types of installations. It is true that they were, and still are, rather crude in design, but they served the purpose of keeping about three-quarters of the oil out of the low side and these crude, hand operated traps were, until recently, the only means available for the purpose but we must remember that until very recently, all commercial machines were under the care of the owner, or other attendant who watched the oil in the sight oil glass of the compressor and in general supervised the operation of the entire installation.

With the advent of the complete automatic installation it became increasingly necessary to find some means for trapping the oil, and in this statement, we mean all of the oil and not merely the large chunks (as one engineer aptly expressed the quantity, or proportion, separated out by the old style traps) but to separate the oil completely from the refrigerant and to return it automatically to the compressor as rapidly as it accumulates in the separator.

Oil Gathering in Evaporator

Every man who has serviced the flooded types of evaporators knows that there has been plenty of trouble due to oil gathering in the evaporators, causing loss or entire stoppage of all refrigerating effect and usually necessitating the removal of the evaporator and purging it completely of its oil accumulation. This accumulation occurs regardless of the refrigerant used.

It may be objected that not all evaporators gather oil in quantities sufficient to cause trouble, and we quite agree that this may be the case, but it is still maintained that this condition persists in enough installations to cause service troubles and costly dissatisfaction to the user.

The dry gas or direct expansion type of evaporator does not present the same train of oil servicing troubles, as it is comparatively easy to secure a good return of lubricant from these coils, particularly if there is no manifolding of coils from a header.

With a single coil evaporator it would be idle to say that oil does not return to the compressor, however, there is always sufficient oil to coat the coil from one end to the other, thus cutting down the coil efficiency to some extent.

Even in single coil evaporators the tubing can be so wound that numerous traps are formed that may cause faulty operation as oil accumulates during the regular cycling of the unit in these loops, or pockets.

Different Evaporator Designs

In the small machine industry there have been proponents of various designs of evaporators, in fact it might almost be said that there are as many styles in evaporators as there are in women's hats and the styles change from time to time, just as they do in the bonnet business.

A dozen or so years ago, while connected with one of the then three or four prominent unit manufacturers making at that time nothing but domestic sulphur dioxide machines of the direct expansion type, it was decided to go into the ice cream cabinet field. Competitors were using flooded boilers with low side floats but the management of the company said that "we are direct expansion people, we don't believe in flooded systems."

However, after trying for several months to make their cabinets work on the direct expansion system without success, they finally changed to the low side flooded coils. Then came the struggle to get the oil back from the boiler to the crankcase and to find lubricants which were sufficiently soluble in the sulphur to keep the oil in solution so that the liquid receivers would not gradually fill with oil and thus starve the compressor.

Another concern using a high side float evaporator with a long single tube evaporator with an accumulator at the outlet end of the coil found considerable difficulty in securing the return of the oil, as it seemed to have the habit of remaining in the accumulator to the considerable disadvantage of the compressor, which found itself many times without lubricant of any kind.

Many schemes and devices were brought into use to bring the oil back and dozens of patent applications were rushed into the patent office covering these various schemes, and it may be said that some of them had considerable merit.

However, when it came to the multiple installations in apartment buildings with evaporators located at varying distances from the compressor and at varying heights above the compressor it was found that new problems of oil return began to show up in bewildering numbers. This condition was true regardless of whether sulphur or methyl chloride was used as the refrigerant. Engineering attention was focused on bringing the oil back from the evaporator instead of trying to prevent it from getting there in the first place, and that seems like going the wrong way around to get at the basic problem.

From 1923 on, new companies began to spring up like mushrooms until in 1926 there were at least 176 concerns that were either actively making machines, or threatening to make them and from that time until the present this number has increased and decreased almost like the ebb and flow of the tide, but nothing particularly new or of lasting benefit was contributed by this multitude of manufacturers to fundamental problems of keeping oil out of the low side of the refrigerating system.

First Oil Separator

Along in 1924-5-6 one company (then using isobutane as a refrigerant with a direct expansion evaporator) decided that inasmuch as the oil and the refrigerant were apparently miscible in all proportions that it would be a good plan to keep the oil separated out of the isobutane, or at least to separate it before the mixture reached the evaporator. The engineers designed a float type oil separating device designed much along the lines of an automobile carburetor and with a single perforated steel plate serving as a collector for the oil. This simple device worked after a fashion and did separate out a great deal of the oil from the refrigerant and returned it automatically to the crankcase.

Two or three years later another company using methyl chloride as the refrigerant and with a low side float evaporator of the flooded type, decided that it was necessary or advisable to keep oil from the evaporator and so they designed quite a clever float device as a part of the compressor unit for returning the oil immediately to the compressor crankcase. This device seemed to be fairly effective and actually did separate out a part of the oil, and very little oil trouble resulted, although it should be noted that the float type evaporators used by this concern at that time had the usual oil collecting devices incorporated in them.

Shortly after this time (1929-30) another concern developed a small float type oil separating device which depended merely on slowing down of the discharge gas velocity in order to complete the separation of the oil from the refrigerant. This was better than no separator at all, as this trap actually did separate out some of the oil, but the difficulty here was that the float shell was entirely too small for anything but the very smallest compressor and entirely too small for some of the units on which it was used.

Return 100% of Oil

Early in 1932 we began an intensive study of this oil separation problem and various schemes and devices were tried out. The plan was to separate out 100 per cent of the oil immediately after the discharge gas left the compressor and to return it quickly and without fail to the compressor crankcase where it performs its only useful function.

Not the least of the problems was to do this work in a small compact device as space is very limited in the usual self-contained unit consisting of compressor, condenser, motor, and liquid receiver on a single basis. Space is always crowded and there could be no room for a large bulky cylinder.

Another consideration was the advisability of having all interior parts accessible for repair, cleaning, or other inspection. Various schemes for baffling the gas with multiple plates, plates with perforations, fine and coarse screens, metal and glass wool, asbestos, etc., were all tried but there was still the necessity for getting at the float mechanism and, too, there was the problem of selecting a float that would stand the pressures and yet not be too bulky.

Due to the fact that these devices must be subject at all times to the discharge pressures, a needle with too large an orifice would overcome the flotation effect of the ball, and the needle valve would remain closed.

The float ball finally decided on is approximately 2 in. in diameter, it is of steel and the halves are copper hydrogen welded into an almost perfect sphere. The orifice of the seat is approximately .055 and up to 195 lbs. head pressure, the ball will overcome the piston effect of pressure on the needle and the needle will lift from the seat and permit the flow of oil back to the compressor.

Description of Separator

Now for the separating device itself: we found that in order to get complete separation it was necessary for all of the discharge gas to impinge on an oily surface and to remain in contact with an oily surface, not merely instantly, but for an appreciable length of time, so our next step was to take a tube of a size larger than the inlet to the trap and place a spirally wound piece of metal strip in the upper end of the tube so that the gas would necessarily have to travel in a devious path around this spiral and as it left this part of the tube, the gas found itself in a more densely crowded section of metallic ribbon, or shredded metal, where it was simply impossible for the gas to leave this jungle without contacting oily surfaces many, many times before it could reach the comparatively open spaces of the separator shell.

It must be understood that there is a difference of several hundred degrees in Fahrenheit temperature between the boiling point of any of the common refrigerants and any lubricating oil, and, while with some refrigerants we find that the oil mixes with it very readily and in almost all proportions, yet when relieved from pressure, the refrigerant will boil out very rapidly from the lubricant and, even under pressure, the oil will seek its own kind and gather readily on the oily surfaces.

The mixture of gas and oil leaves the compressor in a heated condition and in a nebulous or foggy state. The refrigerant contains both the latent heat of evaporation and the heat of compression which will be dropped in the condenser but the oil has not, as yet, received any appreciable heat of vaporization and, consequently, has less heat to drop out and in passing through the separating tubes it is found by actual observation that there is a complete separation, but only when these tubes have sufficient area to accommodate all of the gas from the compressor without building up a restriction, or back pressure, as it might be termed.

The problem was worked out successfully and with a resulting separation of approximately pure refrigerant gas, free from oil.

The problem had only begun with the completion of the first small separator. Larger compressors demanded larger separators and this meant larger separator tubes and finally multiple tubes attached to a single header with a small dump trap separate from main separator body.

*Address delivered at Refrigeration Service Engineers' Society convention in Detroit, Oct. 25.

Benson Describes Construction of Sheet Metal Evaporator

By J. H. Benson, Chief Engineer, Mullins Mfg. Co.

THE sheet metal evaporator is formed from one or two sheets of metal. In either case there is an outer shell and an inner shell portion, either one or both of which are stamped to form header portions and corrugations which complete a refrigerant liquid and gas enclosure when matched together and welded.

In some processes these inner and outer shells are welded together in the flat, between the corrugations and around the periphery of the sheets at all contacting areas. When thus welded the evaporator shell assembly is formed to any desired shape of sharp freezing chamber.

Naturally, the corrugations define paths which direct the refrigerant in surrounding most effectively the freezing chamber and to obtain maximum heat transfer from the refrigerant through the evaporator walls and to the surrounding air or ice cube trays which they may be contacting.

This described method is time proven and now is generally regarded as the most practical and economical one to use in sheet metal evaporator fabrication and can be applied to sheet metal in either the ferrous or non-ferrous classifications.

Thus, the choice of material will offer various final finishes any of which match the motive of the cabinet designer.

Where the demand is for large ice cube capacities, fast freezing is obtained by placing the ice cube trays on refrigerated surfaces which are either a part of the bottom or walls of the evaporator or in the form of separately fabricated and attached sheet metal refrigerated shelves.

With sheet metal evaporators a coefficient of heat transfer is obtained ranging from 2.4 to 3.4 B.t.u. per hour per square foot per degree temperature difference between the refrigerant and box temperatures.

These high values are obtained in different types and designs of evaporators, and the entire exterior surface area is used to compute the average values which, of course, are affected by air circulation in the cabinet and refrigerant circulation in the evaporator.

AIR CONDITIONING

Candy Co. Overcomes Problems of Dipping By Air Conditioning

LOS ANGELES—Hot, sultry days that mean dripping, melted candies to confectioners, no longer can block the progress of the Welch's Candy Co., Ltd., here, because its chocolate dipping room has been equipped with an air-conditioning system.

The air-conditioning unit installed by York produces a temperature of 65° F., and a relative humidity of between 40 and 50 per cent. With these conditions prevalent, the chocolate coating sets in about 15 seconds. Working conditions for the girls employed in dipping the candy have also been improved, says the management.

Equipment is designed to take care of the load imposed by heat leakage, electric lights, gas burners beneath the chocolate pans, and also to supply sufficient fresh air. There are windows at one end of the dipping room, and two doors connect this room with the rest of the plant. The unit cools a storage room next to the dipping room, also.

The system installed has a York model C-600 air conditioner, a York 3-hp. Freon condensing unit, and ductwork to distribute the air properly throughout the room. Placement of the conditioner at the ceiling at one end of the room conserved valuable working space.

Air Conditioning Threatens To Overtax Water Supply Says Plumbing Inspector

NEW YORK CITY—"The increasing use of air-conditioning machinery soon will overtax the nation's water supply," declared A. R. McGonegal, chief plumbing inspector of Washington, D. C., in a recent issue of the *New York Herald Tribune*.

"Twice as much equipment was sold in 1934 as during the preceding year," Mr. McGonegal declared. "Within three to five years the use of air conditioning will multiply the consumption of water tenfold, and water plants will have to be remodeled to meet the increased demand."

2-Hr. Operation Performed In Air-Cooled Comfort

FAIRMONT, W. Va.—Shortly after the installation of air-conditioning equipment in the operating room of the Davis Memorial Hospital—said to be the first installation of this type in the state—Dr. B. I. Golden performed a two-hour operation with no weather discomfort although outside temperatures were over 90°.

The cooling unit was installed by Paul Haymond, service supervisor for the Monongahela West Penn Public Service Co., and his assistant. Hospital officials are considering an installation in the emergency room.

21 Air-Conditioning Installations Made This Year In Birmingham Bringing Total to 45

BIRMINGHAM, Ala. — Twenty-one installations of air-conditioning equipment have been made here this year, bringing the total installations for all years to 45.

Thirteen of the installations were made in 1934.

Places putting in air-conditioning systems this year included five private offices, three residences, three restaurants and drug stores, six general stores, one theater, one automobile showroom, one automobile service station, and one broadcasting studio.

Biggest job was the $100,000, 350-ton installation for the new Loveman, Joseph and Loeb department store. Basement, four floors, and mezzanine are completely air conditioned.

Efforts of the Birmingham Air Conditioning Bureau have been directed towards getting at least one installation in each type of business, in the belief that others will eventually have to fall into line.

To this end the Bureau advertises the first installation freely in the newspapers with such headlines as "Shoe Store Installs Air Conditioning." The summary for Birmingham follows:

* * *

Type of Establishment	Prior to 1934 No.	Prior to 1934 Hp.	During 1934 No.	During 1934 Hp.	During 1935 No.	During 1935 Hp.	Total Through August, 1935 No.	Total Through August, 1935 Hp.
Offices	3	6	5	11	5	37	13	53
Residences	3	35	2	3	3	4.5	8	42.5
Restaurants and Drug Stores	2	42	1	5	3	118	6	165
Stores	1	141	3	18	6	645	10	804
Theaters	2	570	1	12	1	13	4	595
Automobile Show Rooms	..	..	..	..	1	13	1	13
Automobile Service Station	..	..	..	..	1	1	1	1
Radio Studios	..	..	..	..	1	1	1	1
Industrial	..	..	1	2.5	..	..	1	2.5
Standby Railroad Cars	..	..	5	50	9	90	14	140
Total With Railroad Cars	..	..	18	101.5	30	921.5	59	1,817
Total Less Railroad Cars	11	794	13	51.5	21	831.5	45	1,677

Average Figures for Estimating Load for Conditioning Given

CINCINNATI—Average figures for approximating the capacity and cost of air-conditioning installations were given by E. B. Murray of E. B. Murray and Co., Kansas City, Mo., before the convention of the National Association of Building Owners and Managers held here recently.

In presenting the estimates, Mr. Murray pointed out that unusual circumstances entering into the installation will materially affect cost and capacity, but that correct factors to meet special cases can be applied, to obtain at least a rough check.

The figures, which, the speaker said, had been applied in estimating a number of installations which, after checking, had been found correct within a small degree of variation, are as follows:

To estimate tonnage required:

Offices and banks—0.3 ton per 100 sq. ft.

Restaurants—One patron per 15 to 20 sq. ft., to which must be added the number of employees, 0.1 ton per person.

Stores—0.325 tons per 100 sq. ft. The factor here is higher because of heavy light load, and the frequency with which doors are opened.

To estimate costs of installation:

Cost per ton for above ranges from $250 to $350, or for

Offices and banks—$1 per sq. ft.

Restaurants—$1.30 to $1.50 per sq. ft.

Stores—$1.15 to $1.50 per sq. ft.

Operating costs:

Consumption—1 kw. per hour per ton; 1 to 1½ g.p.m. of water per ton.

Approximately 25 cents to 30 cents per day (of 10 hours) per ton on total operations (electricity and water.)

Repairs, renewals, and labor costs not included.

A break-down of the average installation cost is as follows: duct work, 25 per cent; fans and apparatus, 35 per cent; refrigeration, coils, compressors, 35 per cent; controls, 5 per cent.

Another simple rule for determining the approximate tonnage required for various classifications is the following:

Types of Rooms	Cu. Ft. Per Ton
Cafeterias and lunchrooms	1,000 to 1,500
Barber and beauty shops	1,200 to 1,800
Dining rooms and retail stores	1,500 to 2,000
Theaters	1,800 to 2,400
General Offices, Club Rooms, Funeral Parlors	2,000 to 3,000
Banks, Brokers' Offices, Private Offices, Residences	2,500 to 4,000

Air Settling & Lighting Load Are Overcome in Cooling Night Club

MONTREAL, Que.—Unusual air-conditioning problems were encountered when H. Feldman, president of the Club Lido here, installed a year-'round Kelvinator air-conditioning system in his night club to eliminate smoke, odors, dust, and street noises.

The design of the new club, which replaces the old Stanley Grill formerly operated by Mr. Feldman, has a sunken oval in the center of the cabaret for dancing, with tables terraced along either side. Over the dance floor is a domed ceiling with indirect lighting.

With this set-up the two problems to be solved were: (1) to eliminate the danger of cold air settling in the well caused by the 8-in. drop in the dance floor level and (2) to take care of the possibility of an additional 7½-ton air-conditioning load caused by indirect lighting.

The indirect lighting in the dome was glassed over, and an exhaust from the cabaret was provided to draw the air from around the lighting. This lowered the 7½-ton load to around 2 tons.

Two more exhausts at the orchestra end of the sunken floor were installed to eliminate the possibility of cold air settling over the dance floor. These exhausts also take care of the dressing and rest rooms.

Kelvinator equipment installed consists of a 20-hp. condensing unit, cooling coils, and an oil boiler-burner unit for heating during the winter months.

Equipment was sold and installed by H. M. McGaughey, Kelvinator air-conditioning engineer.

Servel Conditions Air in Tobacco Export Office

HENDERSON, Ky.—Servel year-'round air-conditioning equipment has been installed in the new executive offices of the Charles T. W. Argue tobacco exporting firm located here. Construction of the new offices provided for the air-conditioning system, with special attention given to insulation to reduce heat losses.

Equipment consists of a 3½-ton Servel air-conditioning compressor connected to a heavy-duty, suspended-type conditioner, from which air is delivered by way of a duct system to five separate offices.

Department Store Manager Tells How System Was Designed To Meet Conditioning and Lists Results of the Installation

NORFOLK, Va.—Immediate benefits in the form of increased sales, cleanliness of stock in the ready-to-wear departments, and patron and employee comfort are reported by Smith & Welton department store here, as a result of the York air-conditioning system which it installed early this summer.

Frank Welton, vice president and manager of the store, credits the air-conditioning system with the following accomplishments:

1. A decided increase in sales volume.

Reduces Sales Resistance

2. Reduction of the petulance (and sales resistance) of customers, usually induced by hot, sticky weather.

3. Improvement in the cleanliness of stock in the ready-to-wear departments, by elimination of dust and contact with excretions from the pores of the skin, and a consequent drop in spoilage.

4. A rise in employee efficiency and mental attitude, the result of comfortable working conditions.

5. A 75 per cent increase of sales in the store's fountain room and beauty parlor.

Helps Plan System

Mr. Welton, himself a graduate engineer, worked in close cooperation with the firm of Carneal Johnson & Wright, Richmond, Va., consulting engineers, in planning and installing the system, which presented several interesting and unusual problems.

First problem was how to install the system without lessening the attractiveness of the store's interior, particularly in the first and mezzanine floor sections.

The building was designed with a large court, or "well," in the center of the first floor. This construction made it necessary to plan the duct work and outlet grille connections carefully, to obtain proper distribution of air without drafts.

Another problem rested with the concentrated heat loads on the mezzanine area, occupied by a lunch room and fountain on one side, and a beauty parlor on the other. The obvious solution was prohibited, because the decorative scheme would have been affected if ducts were run across the ceiling panels and beams.

Direct Expansion of Refrigerant

A feature of the air-conditioning system is that the refrigerant, Freon, is circulated directly through the cooling coils.

The plant has a capacity equivalent to the melting of 120 tons of ice per day, and consists of a 12½x10-in. two-cylinder York Freon compressor, direct-driven by a 125-hp. synchronous motor, and a large York shell-and-tube condenser.

Total air circulation throughout the building is 50,000 c.f.m., providing a complete change of air every eight minutes. The system will maintain an inside temperature of 78 to 80° F. dry bulb, when the temperature outdoors is 95° F.

Separate air-cooling plants take care of the fluctuating heat loads on the various floors. One takes care of the main floor and mezzanine, and others handle the second, third, and fourth floors. Each consists of an extended-surface type dehumidifier, circulating fan, moisture eliminator, and scrubber, for summer operation. Fresh air intakes are fitted with louvres and screen, and filters clean both fresh and recirculated air.

Units Controlled Separately

Each unit is separately controlled and independent of the others in its operation. All are equipped with fans driven by variable speed motors, permitting unusual variation of operation both in summer and winter months.

Controls are so arranged that a slight variation in temperature or humidity in the area served will cause the system to pick up the load, and maintain a constant condition at all times, with a minimum of variation. Dry bulb and moisture controls operate in parallel on the refrigerant supply to each dehumidifier, and are arranged to provide refrigeration whenever air conditions call for reduction in either temperature or humidity, or both.

By-Pass Around Humidifier

For economy in operation, an air by-pass is installed around the dehumidifier to allow some of the recirculated and filtered air to be by-passed and mixed with the dehumidified air. This arrangement prevents fluctuating temperatures, and eliminates the use of steam, which is sometimes required to reheat dehumidified air in summer months.

To obtain a neat system of supply and return air grilles, and at the same time provide a uniform distribution of conditioned air in the main floor areas, the air is carried in a duct of uniform cross section which extends around the face of the balcony at the mezzanine floor level, with outlets discharging air horizontally and angularly upward into the court.

Space above the mezzanine is supplied from the same distributing system, by outlets discharging under the balcony on the opposite side.

Vertical Risers on Columns

The same main distributing duct provides air vertical risers on each column, conveying the conditioned air to grilles located at the top of the column to supply air to the mezzanine floor.

Return air is taken from various points around the main floor and mezzanine, and conveyed through ducts in the ceiling of the basement, back to the conditioning apparatus.

Duct work in the store's upper floors is as carefully blended with the building's decorations as that for the main and mezzanine floors. This required considerable care in locating ducts and grilles to make the neatest appearance, and still secure the best arrangement for proper air distribution.

Functions of Air Conditioning Described by Mabley at Servicemen's Meeting

DETROIT—What an air-conditioning system should accomplish, and some of the problems that face an air-conditioning installation engineer, were discussed by T. H. Mabley, engineer for the Air Conditioning Corp., local dealer for General Electric air conditioning, at the Thursday morning technical session of the Refrigeration Service Engineers Society convention here last week.

The four fundamental functions of air conditioning, said Mr. Mabley, are: first, control of temperature; second, control of humidity; third, control of circulation; fourth, control of cleanliness or air purity. A complete air-conditioning system to some extent performs all four of these functions for both winter and summer conditions.

"The problem of automatic control for the entire year somewhat complicates itself since, contrary to general opinion, the desirable room temperature is not constant year 'round, but ranges from about 70° in mid-winter to about 80° to 85° in mid-summer." Mr. Mabley declared.

"This, perhaps, can be explained on a physiological basis by saying that our bodies would rather have a warmer mean temperature in summer than in winter, rather than stand the shocks of too great a drop between inside and outside conditions during the hot summer days.

Temperature Control

"The only time we are interested in a fixed temperature for all seasons of the year is perhaps in a processing job. We, therefore, find it necessary to so design our cooling equipment to give us the maximum temperature reduction at times of extreme summer temperatures but our control, if ideally automatic should be designed to alter this temperature difference so as to reduce the difference between inside and outside conditions as the weather becomes cooler. Some of the commercial installations that advertise '70° inside,' or '20° cooler,' may be kicking back on themselves due to the desire to freeze their customers rather than give them air conditioning along the lines we have been considering."

Control of temperature, said the speaker, is interlocked with the second fundamental function of air conditioning, namely control of humidity.

"It doesn't take an engineer to realize that a room at 72° and 10 per cent relative humidity may feel colder than a room at 70° and 50 per cent," he stated. "Humidity is simply the measurement of moisture content in the air. The relative humidity is the portion of moisture already in the air as a percentage of the total amount of moisture required to saturate the air at the given conditions.

Humidity Problems

"Since we know that warm air will hold more moisture before it becomes saturated than cold air, we can understand why cold air even though its humidity may be 90 per cent when heated it becomes something like 10 per cent. This is just what happens in winter time; we bring cold air with a small amount of moisture into the house and heat it up and its relative humidity becomes very low, hence we have the feeling of dryness in winter. Again, contrary to some household practices, opening of windows in a tight but well heated house does not necessarily increase the relative humidity in that house.

"When we come to summer humidification control we have the reverse operation of removing moisture from the air to give a comfortable condition. Again we apply the previously mentioned fact that warm air has the capacity to hold more moisture than cold air. If we cool the air we can condense the moisture out of the air in the same way that the coolness of the night causes the moisture to come out of the air in the form of a dew."

Independent Humidity Control

Mr. Mabley told the conventionites that the actual control of summer humidity is a difficult problem and so much so that at the present time most conditioning installations merely control the dehumidification as a function of cooling. In other words, the temperature is controlled with a thermostat and summer dehumidification will be accomplished to whatever extent the cooling coils will permit while in operation for air temperature reduction.

The most recent developments along the line of coil and control design, the speaker averred, are tending more and more toward an independent control of humidity for summer conditions.

Considering the third function of air conditioning, the control of circulation, Mr. Mabley said:

"We know that we feel comfortable with a fan blowing air past us rapidly on a warm summer day and on the other hand the same fan blowing the same amount of air might feel very uncomfortable in winter. Here we have a good example of one of the limitations of air circulation in air conditioning.

"Circulation of air serves two major purposes; first, it serves the purpose of changing the air so the air as it becomes too hot, too cold, too humid, or too dry, may be exhausted or returned to the conditioner for reconditioning and replaced by conditioned air. This change of air if rapid enough also assures a fairly even distribution of temperature throughout the conditioned space. The second purpose of circulation tends more directly towards comfort and is best illustrated by the fan which I have just mentioned.

"As you all know the body is a machine and like a machine, an automobile for example, it must throw off part of the heat energy taken into the system in the form of fuel or food. The automobile accomplishes this with its radiator. The human radiator is the skin itself.

Heat Generated by Body

"Amount of heat actually thrown off by the human body has been measured and the actual figures range from 400 B.t.u. for a person seated in a room up to over 2,500 B.t.u. given off by a person in an extreme state of physical activity such as running up a hill.

"To give you a simple illustration of what this amounts to I might explain that the total heat generated by 250 people seated and at rest is sufficient to heat a modern 6 or 7-room house in the middle of the most severe winter. The same could be accomplished by the total heat from 45 people in the state of vigorous activity equal to a five-mile-an-hour walk or the like.

"Therefore, we must have a movement of air to facilitate the removal of this heat from the body and prevent the temperature of air very close to the body from building up to an uncomfortable degree. On the other hand, we can have the other extreme of this condition with too great a movement of air or circulation of too cool air with the result that heat is taken from the body faster than the system can generate heat."

If the housewife could dust only twice a week instead of three or four times and if the women's apparel shop owner could cut his cleaning bills in half by elimination of dust and dirt from the outside, the importance of the fourth function—cleaning—would be realized, said the speaker. Today this performance is actually possible.

Methods of Filtering

"Filtering is accomplished in various manners, such as washers, scrubbers, oil filters, and dry filters of either the cleanable or renewable type. These filters are designed to remove the largest part of the foreign matter found in the air but do not leave the air entirely pure.

"The cost and design of equipment," declared Mr. Mabley, "has limited the capacity of the filter to do more than say a 95 per cent job in respect to dirt removal and much less efficient job as to smoke, odor, and pollen removal. However, the results obtained have warranted the use of filters on almost every complete air-conditioning job.

Removal of Odors

"The problem of smoke, odor, and pollen removal is still being worked on in the laboratories and no positive statements can be made at the present time as to what we may expect in the near future along this line. We do know that the use of filters with some means of cooling and dehumidification has given some appreciable relief to approximately 50 per cent of hay fever sufferers, but so many other factors have entered into the picture that scientists are not yet certain just what obtainable air conditions will give 100 per cent relief from hay fever.

"Engineers are still working with the problem of reducing highly objectionable concentration of tobacco smoke. At the present time the most effective method is to exhaust the smoky air to the outside and replacing it with fresh air, but this practice is costly because the air brought into the area has to be conditioned before introduction into the room."

The speaker made the statement that in perhaps 95 per cent of the new homes now under construction we find this central conditioner which in most cases performs the functions of temperature control, humidity control, filtering, and circulation for winter and occasionally we find an installation to carry out these functions for both winter and summer.

"If the air-conditioning system for winter is properly engineered and installed the major requirements to make the job complete for both winter and summer is the installation of a condensing unit and evaporator along with perhaps a few minor changes such as insulation of basement duct work to prevent sweating, or possible changes or additions to the control system," he said.

"The performance of the system for summer cooling and dehumidification depends a great deal on the original engineering of duct distribution system as well as the proper installation of the condenser and evaporator coils.

"In the case of the home already built the same problem for an air-conditioning engineer is found as in an office or small commercial building. In these cases we must resort to the best method which is usually a compromise between the ideal system previously mentioned and the present heating or ventilating system.

"One of the biggest problems of the air-conditioning engineer is to know how far he can go without doing too much cutting and altering of the building walls, floors, and partitions and making the installation costs prohibitive.

"The resulting compromise installation may be, for instance, a unit in the basement of the home with a duct distribution system to handle the first floor and on the second floor replacement of radiators with individual air-conditioning units. This individual room unit may be one of many types. It might be entirely self contained, either portable or stationary or it might be a unit with a conditioner coil, humidifier, blower, and filter, and with steam, water, or refrigerant lines connected to another unit in the basement.

"These small units are just replicas of the large unit previously described and it is easy to see that if one large unit could be installed to distribute conditioned air to the various rooms it might be the most economical method."

Billiards and Bowling Become Year-'Round Recreation with Air-Cooling Installation

FRESNO, Calif.—Devotees of billiards and bowling can enjoy their favorite sports every night of the year in the Rialto Recreation, Inc., here—that is, if they can get a reservation.

For, since Manager V. B. Hayes has modernized his establishment through the installation of air-conditioning equipment and a beer precooler, patrons have crowded the bowling alleys and billiard tables, some of them waiting until 1 o'clock in the morning to take their turn.

Fresno is a city with a trading area of about 75,000 people, and with a climate that hits 100° F. just about every day during the summer months. Because of this, even the most ardent golfer gives up his sport until cooler times, and as for any indoor recreation—well, it just wasn't even considered.

Winter Crowds in Summer

But, since Mr. Hayes has installed his air-conditioning system, summer business at his bowling and billiard academy has passed what many other places ordinarily do in mid-winter, when the season is at its height.

There never was any reason—except discomfort—why billiards or bowling should have a decrease in patronage during any month of the year, Mr. Hayes thinks. What decrease there is has been due to hot, sultry weather. And the fact that his 12 alleys and 11 billiard tables have been crowded ever since he installed air conditioning seems to bear out his contention.

A 20-ton Frigidaire conditioning system, in addition to maintaining a cool, even temperature, also eliminates the close, smoky atmosphere which has always been an objectionable feature of such indoor recreation centers. Elimination of smoke has increased patronage of the place by women bowling and billiard fans, Mr. Hayes reports.

A Brunswick over-the-counter beer cooler is used to pre-cool and dispense beer in the academy's tap room. The establishment is now recognized as the leading beer account in the city.

Now that the real fall bowling season is here, Mr. Hayes is so far ahead on the use of his alleys that leagues have to get in their applications months in advance, if they want to play there.

This, says he, is due to the health factor in air conditioning. By keeping the air clean and free from smoke without the necessity of opening windows, it prevents bowlers from catching colds—a not uncommon happening in smoke-filled, draughty alleys. Clean, fresh air also eliminates smarting eyes, usually encountered when one plays in a billiard room for a period of time.

In fact, Mr. Hayes says, air conditioning helps make better billiard players. It not only improves their physical condition, but also keeps their eyes sharpened and free from irritation, so that hard shots come easier.

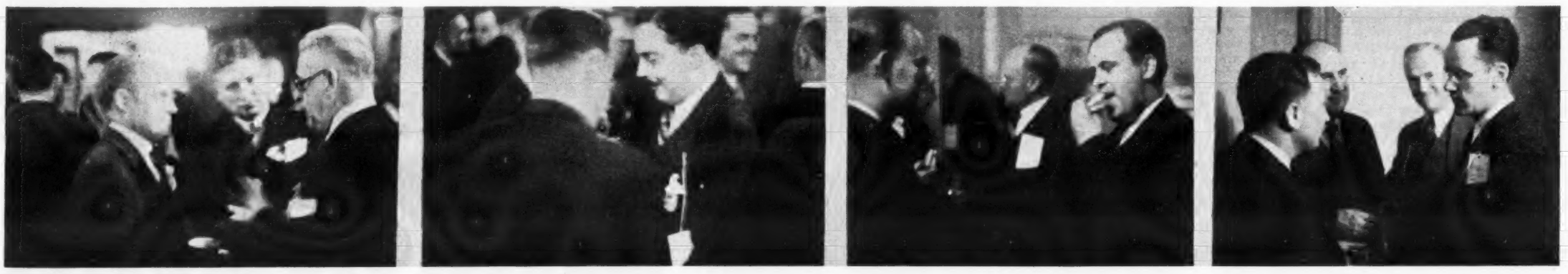
Fedders Adds 7 Units to Line of Heaters

BUFFALO—Fedders Mfg. Co. has added seven sizes to its line of series 3 unit heaters, making 20 standard models in the complete and well graduated line.

Electric Refrigeration News Entertains Refrigeration Supply Jobbers and Manufacturers at 'Open House'

A Temprite beer cooler served its second term at a News party. Inaugural performance was at the "housewarming" for A.S.R.E. men last spring. (1) J. M. Johann, Gordon Muir, advertising manager, and John Wylie, general sales manager, toast each other, and Temprite. (2) Mr. Muir: "What'll you have?" Mr. Wylie: "More." (3) Conference. Subject: advertising. Participants: Fred C. Swanson, Paramount Electrical Supply Co., Helen Gilmore, assistant advertising manager of the News, Master Service Manual Author K. M. Newcum, Kerotest. (4) Miss Gilmore pours.

More manufacturers' display booths, this time along the left side of the Spanish Room. (1) Minneapolis-Honeywell Regulator Co. and Dole Vale Co. (2) Frigidaire Corp. was represented at the convention with an extensive display of household refrigerator parts. In front of the booth are Frigidairemen W. V. Richards and A. C. Ellerbusch. (3) Another view of the Frigidaire booth, with Publisher F. M. Cockrell (center) showing Bob Nixon how he wants things arranged for the News' floor show. (4) Over the coffee cups. C. A. Kabat of Paramount Electric Supply Co., New York City, and Mr. Cockrell listen to a jobber's problem. Their serious, attentive attitude would indicate that a valuable idea may be forthcoming.



The "get-together" at the home of the News, besides giving manufacturers and jobbers a chance to organize formally, also fostered a better spirit of understanding by presenting ample opportunity for informal and friendly chats. Here are some of them. (1) D. P. Heath, McCord Radiator & Mfg. Co.; C. M. Brown, Tecumseh Products Co.; and D. C. Lingo, D. C. Lingo Co., Houston, Tex. (2) E. P. Sorenson of Airo Supply Co. was the center of another little group. (3) K. M. Newcum, Kerotest, and Bruce Palmer, Bush, found plenty of mutual interests. (4) J. S. Forbes, Kerotest, George Bright, well-known Detroit consulting engineer, Henry W. Merkel, Merkel Bros. Co., Cincinnati, and Paul Penn of Penn Electric Switch Co.

Left to right: (1) When three coil manufacturers get together there is plenty to be discussed, as is evidenced by the avid argument which is taking place here between C. T. Bappler of Bush Mfg. Co. (standing, with one foot on a chair); Israel Kramer, Trenton Auto Radiator Mfg. Co.; and R. W. Kritzer, Peerless ice Machine Co. (2) Another view of the three coil manufacturers. still hard at it, after drawing away in a corner by themselves after the parts manufacturers meeting had ended. (3) "Meeting's out" and the jobbers and manufacturers relax and get acquainted. The gentleman in the foreground at the right (taking the political orator's pose, with left hand grasping the lapel), is H. V. Higley of Ansul Chemical Co. Incidentally, Mr. Higley is quite a speaker, drawing the most applause of any speaker at the R.S.E.S. convention with his talk on "Toxicity." (4) Relaxation in full swing, with singing assisted by a violinist and accordionist.

There are smiles and smiles—but the ones that appealed to jobbers most of all were those that greeted the formal organization of the National Refrigeration Supplies Wholesalers Association. Here are scenes as the meeting broke up. (1) At right, L. H. Roberts, Forslund Pump & Machinery Co., Kansas City. (2) Managing Editor Phil Redeker (in shirtsleeves) was in to get the news. H. E. Adams (extreme right), Lewis Supply Co., Memphis, says goodbye to a new-found friend. (3) E. P. Sorenson of Airo Supply Co., and H. W. Small, Thermal Service Co., St. Paul, are making their farewell. (4) Finis. The two-day strain told on Assistant Business Manager Bob Nixon of Business News Publishing Co., who fell asleep in the editor's office.

SERVICE

Servicemen's Society Endorses Plans to Expand Activities

(*Concluded from Page 1, Column 4*)

New officers, who will manage R.S.E.S. affairs for 1935-36, are:

President, J. H. Downs, Detroit; first vice president, Paul Jacobsen, Chicago; second vice president, W. H. Moss, Memphis; treasurer, S. A. Leitner, Kansas City; secretary, H. T. McDermott, Chicago; sergeant-at-arms, Claude Brunton, Huntington, W. Va.

George H. Clark, Detroit, will continue as chairman of the educational and examining board. On the board of directors are E. A. Plesscott, St. Louis; Warren W. Farr, Cleveland; and C. O. McCauley, Pittsburgh.

Officers of the organization last year were:

President, T. J. Fowler, Chicago; first vice president, Mr. Downs; second vice president, G. D. Wang, Milwaukee; treasurer, E. J. Merenda, Brooklyn; and secretary, Mr. McDermott. On the board of directors were H. D. Busby, Chicago; Mr. Brunton; D. W. Walters, Eau Claire, Wis.; chairman of the educational committee, Mr. Clark.

Technical Program

The convention's technical program included talks on "The Necessity for Uniform Symbols in the Refrigeration Field," prepared by Herbert Herkimer, New York City; "How to Conduct a Service Organization from a Financial Standpoint," by E. A. Siebert, Kelvinator Corp.; "Air Conditioning of Small Stores and Homes," by T. H. Mabley, Air Conditioning Corp., Detroit; "Toxicity," by H. V. Higley, Ansul Chemical Co.; "Truck Refrigeration," by O. D. Greenlee, Kold-Hold Mfg. Co.; and "Automatic Oil Separators and Commercial Installations," by Frank Riley, American Injector Co.

Reports of the speeches by Mr. Siebert, Mr. Mabley, Mr. Riley, and Mr. Greenlee will be found on pages 8, 9, 13, and 16 of this issue. Mr. Higley's talk, and the one prepared by Mr. Herkimer, will be reported next week.

Uniform Cost Accounting

Harry Drownes of the Chicago chapter urged members of the organization to adopt a uniform cost accounting system, for their own financial welfare as well as to eliminate price-cutters among competitors.

"Know what your profit will be on every job," he advised. "And be sure that you will make a profit on every job you take. It's better to pass up a job than to take one and lose money on it."

Service men are entitled to a fair profit on every piece of work they do, Mr. Drownes said, but profit cannot be known definitely until costs are known also. Many service men, he contended, were bidding unprofitably for business without realizing it, because they weren't getting a fair price for their labor.

Efficient System Required

He suggested a centralized accounting system, efficient but not elaborate, in which every member would be furnished with a cost sheet, on which all elements which went into the final determination of a job's price could be recorded, total revenue and total cost shown, and profit estimated.

This would enable service men to determine whether they were operating their business successfully, and enable organizations everywhere to charge standard prices and make a standard profit on every type of job done. Most important of all, Mr. Drownes said, such a system would show up price-cutters, and do a great deal to get them out of the service business.

Goldberg Discusses Future

Talking on the organization's future progress, Herman Goldberg of the Chicago chapter told service men that to improve their own personal status, they must improve the status of the industry as a whole.

"Our leadership in this field is one which we ourselves have assumed," he said. "It was not thrust upon us. We asked for it—now we've got it. And it's up to us to do something with it."

Future progress, Mr. Goldberg said, will depend to some extent on the organization of new chapters, but most of it will revert to those already established. Caliber of men in the service field, he said, is on the upgrade—so chapters will naturally improve also.

The objective of the organization, he added, must be to be regarded as the outstanding one of its kind in the country.

Service men have already learned many things through association, the speaker said. Competitors have become friends, through having faith in each other and through respect of the other's right to his share of the business. Constructive measures, he said, have replaced destructive ones.

One of the best things R.S.E.S. can do, Mr. Goldberg said, is to promote a better understanding between small and large business men. This objective, he said, is rapidly being brought to realization.

"The word 'service' can be made to have a real meaning," Mr. Goldberg concluded. "We have assumed a leadership. Let's be worthy of it, by leading the way out of this present and thoroughly distressing era."

Serve Customers Properly

By serving their customers properly, service men will be doing manufacturers the greatest possible service, E. Barger, Universal Cooler Corp., told the service men.

"If you serve customers properly, you will be serving the manufacturer of that equipment just as he would have you do it," Mr. Barger said, "and you will reap a great reward."

The things which service men can do best to serve the best interests of the industry, Mr. Barger said, include formation of a code of ethics, establishment of a feeling of organization, and the setting up of a uniform accounting procedure. This latter, he added, will enable service men to know their costs, so they can obtain a fair profit for their efforts.

Service News Bulletin

Universal Cooler, Mr. Barger said, will shortly bring out a service news bulletin, which it will distribute among service men in the field. He cited this as an example of manufacturers' willingness to cooperate with service men in doing the best all-around job possible.

"Work as a body, not as individuals," Mr. Barger counseled. By doing this, he said, service men will best advance their own interests, as well as those of the various manufacturers.

"Be service engineers, not mechanical puddlers," he admonished.

"We manufacturers are willing to cooperate with you—if you will cooperate with us."

Proposed Amendment

An amendment to the by-laws of the organization, proposed at last week's meeting, would strike out Section 2 of Article X of the document. This passage reads:

"The Herkimer Institute of Refrigeration, New York City, shall be designated an accredited training school, and its graduates shall be eligible for examination to membership in this Society."

Motion to strike out the section arose from the feeling of members that it might be construed as an endorsement of the Herkimer school to the exclusion of others, whereas it is not the intention of the organization to align itself with any training school.

The proposal will come up for consideration at next year's R.S.E.S. meeting, since the by-laws require publication of any proposed amendment at least 30 days in advance of the annual convention, at which such changes are to be made.

Credit System Organized

The universal credit system, adopted by the convention, will set up national headquarters in Chicago, and will assist members in all their credit and collection problems. Local counsel will be employed in collection suits, paid for by national headquarter funds, and a uniform sales contract will be furnished, together with a credit information service in towns in which chapters are located.

Jacob Scher of the Associated Adjusters of America, Chicago, heads the credit service. The committee of R.S.E.S. members assisting him include Harry Drownes, Chicago; H. E. Adams, Memphis; and B. A. Barnes, Detroit.

Frigidaire Sells Parts To Independent Service Men

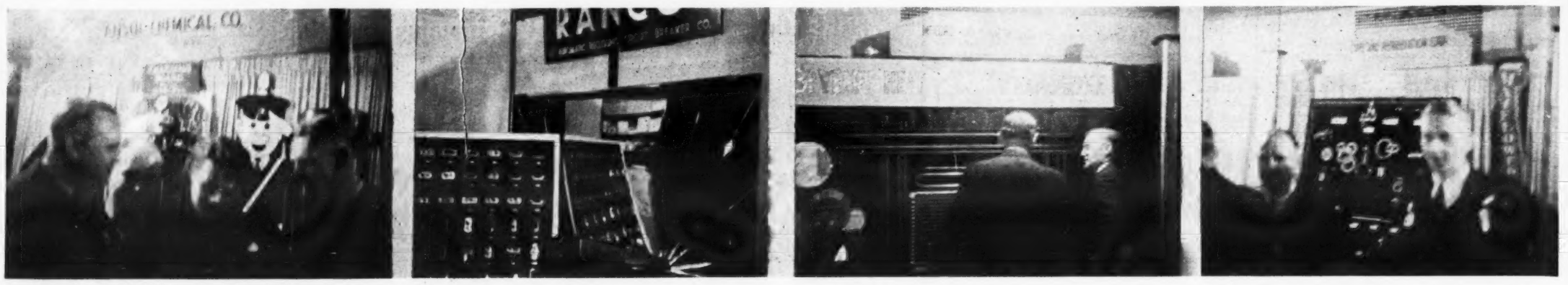
DETROIT—Parts for Frigidaire household and commercial refrigeration systems are now being sold to independent service men by Frigidaire distributors and some Frigidaire dealers.

This was disclosed in the exhibit maintained under the Frigidaire Corp. name at the Refrigeration Service Engineers Society convention here last week. On display were samples of compressor replacement parts, valves, fittings, and recommended service tools.

Parts are supplied by the factory service department to the distributors and dealers who will sell them in turn to independent service men.

Manufacturers Exhibit Replacement Parts to Service Men at Detroit Convention

The walls of the Spanish Room at Hotel Fort Shelby were lined with manufacturers' displays, indicative of the increasing respect which the service man is gaining in the industry. (1) Kerotest Mfg. Co. and Ranco had a spot on the landing, as you entered the room. (2) Midway along the right sidewall was Airo Supply Co. and Utilities Engineering Institute. (3) Just next to this display were those of Electrimatic Corp. and Rotary Seal Co. (4) Side by side, along the back of the room, were Standard Refrigeration Parts Co., Chicago, and American Injector Co., Detroit.



Four of the manufacturers' display booths at the Refrigeration Service Engineers Society meeting last week in Detroit are shown here. (1) Ansul Chemical Co., featuring the "Ansul Twins." (2) Automatic Reclosing Circuit Breaker Co., Ranco thermostats. (3) McCord Radiator & Mfg. Co., heat transfer surfaces. (4) Copeland Refrigeration Corp., commercial compressor parts.

Seibert Says Close Check on Costs Is Way to Profit in Servicing

By E. A. Seibert, Service Manager, Kelvinator Corp.*

BUSINESS history has clearly proven that the one thing lacking, and the principal reason for loss of profits and ultimate failure in small businesses, is the lack of knowledge of just what constitutes the costs of doing business. But perversely, on account of not having this knowledge, a great many men are rather critical of any suggestion that they don't know what their costs are. To learn just what costs really are every item should be considered and taken into account. It isn't safe enough to trust to memory; they should be written down so none are forgotten.

In a business such as men of your organization are operating there are two main divisions of cost.

The *first* is the money you pay for the time of the men who do the actual service work. This is called: direct or productive labor.

The *second* item is called overhead or burden.

The first is an easily determined item and is many times considered as the actual cost.

The second isn't so easily determined as it is made up of many items, but it must be carefully calculated if a correct cost is to be arrived at. I have heard a great many men, who should know better, say: "that's just a bookkeeper's idea of how to make a job for himself." That man couldn't operate a peanut stand successfully. Overhead or burden cannot be ignored in even the smallest business without terribly painful results. Lets see what items are included in burden:

First, comes capital required. This costs you something; if you borrow you must pay interest. If you pay interest it is a charge against your business.

Then comes: rent, heat, light, office salaries, office equipment, insurance, taxes or licenses, shop equipment, supplies, tools, auto expense (including gas, oil, tires, repairs, insurance, and depreciation in value of car), loss of accounts receivable, or, in other words, bills you cannot collect.

Your monthly total of these items represents your overhead and to every hour of labor must be added a sufficient portion to completely absorb this overhead amount.

This may sound complicated but it isn't if you will think about it; it's just simple addition and division, you won't need a complicated set of books, a little experience will soon show you how simple it is and also how necessary to your future successful profit operation.

The next point to consider is parts and their actual cost. The cost of a part is; first, its purchase price; second, its stocking cost. By that I mean the freight, express, parcel post, or other means of delivery, cost of bins, racks, etc., and the cost of selling, which is the delivery to job, office, and sometimes collection costs.

Non-Productive Time Costly

Another item of expense which is neglected in the majority of service companies is the item of lost, wasted, non-productive, or whatever you wish to call the time you pay your men for, but for which they do no work. This time consists of the time men spend around the shop in the morning before they go out on a job; wasted time between jobs; time lost returning for a part that was forgotten.

You will all be surprised how much this amounts to if you will carefully check this item.

In our own branches this item just about represented the difference between a loss and a profit. When we found a way to control the mens' time we started to make a profit, and I am glad to tell you we make a fair profit in our service branches, not too much but our percentage is quite satisfactory.

Application of Cost Items

Now that we have covered all items of cost, how are they applied to a service operation is a question to be answered. The answer is not difficult to find.

First, adopt a policy that you will play fair with your customers.

Second, employ men who will do good work, work that you are proud to stand back of.

Third, guarantee the work done.

Fourth, use the best parts obtainable and not deceive your customers about parts used.

Fifth, charge a fair rate for your services and for parts. Do not cut your prices just because somebody tells you he can get the work done for less by someone else. Perhaps the "some one else" is a man who is irresponsible, is only looking for the immediate dollar, and of course won't last long. These fellows will come and go as long as machines are built.

Stand Back of Your Work

I am sure that the greatest handicap you men will have to overcome in establishing yourselves in a community is the fear that irresponsible parties will cut into your business. Just as soon as people know they are dealing with an honest, trustworthy, reliable, and aggressive company they will help increase your business by telling their friends about you. I know of a radio repair man who very seldom loses a customer, no matter what radio they have, just because he fixes the radio, and stands back of his work. His charges are at least as much, if not a little more, than most other similar men charge.

We now come to the subject of *collections.* There is no question that the only profitable method is to collect for a service call before leaving the customer's home.

If collection is not made at that time your chances of collecting are not very good, and even if you do collect your cost of collection eats up all possible profit.

Just figure up some time the time, phone calls, stamps, paper, etc., you spend collecting two to three dollar items. You will find that it is just about as profitable to forget such items as to try to collect them.

Of course, you will have some customers whose credit is good and with whom the volume of work you do is sufficiently large to permit you to render monthly or semi-monthly invoices. You cannot collect each time a call is made from such people as they would not possibly handle their business that way. When you do have such customers they should pay their bills for services rendered when they are due and you should insist upon it.

It isn't enough that a man opens up a service company, tells a few of his friends that he is in the business and then sits down to wait. He will have to do some advertising. By that I do not, necessarily, mean newspaper advertising which, probably, would not do you much good in most cases, but you will have to do some house to house canvassing, personally soliciting business from people, leaving your telephone number and address and a card in some prominent place near the equipment so it will be convenient for them to call you.

After you have once secured a customer you should record his name, address, and type of equipment very carefully. About once or twice a year you should send him a letter or, possibly, personally call upon him, see if there isn't something you can do and bring yourself to his attention again.

Building Up Business

Some means such as this will have to be employed to build up your business. This is another item of cost that will have to be considered because you will have to get the money back that you spent; the only way you can get it back is through the labor and parts that you sell.

In going over all of these items and telling you what you should do I do not mean to infer that I know how to run your business; I am just telling you of the methods employed in a successful service operation and an operation that makes a very satisfactory profit—where the rates charged the customer are fair and have been reduced over the last several years, even though material costs and labor rates have risen.

In these operations that I speak of a very careful record is kept of every item of expense. They stand on their own feet just as you men will have to do; they are not subsidized in any way and the methods used in the operation of these service branches are just exactly the type of operation I am recommending for you.

Nothing is left to chance. We know every day the amount of expenses we will have that day. We know from history about how much income we are going to get so when the time comes when the expenses seem to be approaching a point where it is greater than the income something has to be done immediately to increase the income and at the same time decrease the expenses so that a loss will not be shown. Some expenses cannot be decreased so increasing the income is the thing of major importance.

Simple Bookkeeping System

I hope you men will not get the idea that the suggested methods of operation are complicated, requiring a highly technical bookkeeping system because such a thing is not needed, it just requires sufficient bookkeeping to set down each item of expense so that you will know just exactly what that item is.

After you have studied it for a couple of months you will find that you are able to do a lot of things that you could not do before because you were afraid that you were going to lose too much money.

You will be able to charge your customers a fair rate for your services and you can convince your customers that you are right.

I am quite sure you realize that if you are ignorant of the actual cost when your customers say your rates are too high you haven't a good selling argument.

When you do actually know what your expenses are you can convince your customers you are charging a fair rate.

Your men are particularly well situated in a good many instances to do a better selling job than a real large company because people like to do business on a personal basis. They realize that the man who is conducting his own business is generally a little more interested in the customer than some employee is.

*Address delivered at Refrigeration Service Engineers' Society convention in Detroit, Oct. 24.

MASTER SERVICE MANUAL

Chapter 9—Service

Service Complaints & Remedies On Type 1A Systems

By K. M. Newcum

77. Complaints on Type '1A' Flooded Systems (Continued)

Complaint No. 8: Motor Starts and Stops Too Much

Check the switch setting to see that it is set correctly for the type of refrigerant involved to maintain a proper on and off cycle.

Examine the evaporator for an oil logged condition. Refer to page 79, (Introduction to MASTER SERVICE MANUAL, Chapter 5, Evaporators).

Check the discharge valve for leaks. Check for a shortage of refrigerant, and an open float valve. Either of the above conditions by allowing high pressure refrigerant to leak into the low side will affect the low pressure control and cause it to cut in prematurely.

Complaint No. 9: Blowing Fuses or Overload Relay Continues To Cut Out

Check the size of the fuses to see that they conform to the sizes given under motors, Chapter 7. Or if equipped with overload relay check the heater coil to see that it conforms with the sizes listed for different sized motors on page 106, or as specified by the manufacturer.

Inspect the switch contacts for arcing. Excessive arcing from dirty or burned contacts may cause the trouble.

Check the system for high operating head pressure.

Check the motor for starting under no load and load conditions.

Check the compressor for stiffness from lack of lubrication. Another condition causing stiffness and blown fuses is moisture in an SO_2 system, causing the compressor parts to cease and become tight during the off cycle.

A belt that is too tight causing the bearings to bind may cause blown fuses.

Complaint No. 10: Compressor Knocks

See Complaint No. 5: Compressor Noisy.

Complaint No. 11: Compressor Runs Continuously; Noise Inside Cabinet

If the compressor runs continuously it is evident that it is unable to reduce the pressure on the low side and control bellows sufficiently to cause it to cut out.

This could be caused by a number of mechanical irregularities as given in the preceding complaints, or by the switch controls stuck shut. If the switch were stuck in the closed position and all other parts of the system were functioning correctly, the continuous operation will cause the food in the refrigerator to freeze.

If the food does not freeze, and other mechanical difficulties do not exist, the noise inside the cabinet or at the evaporator would indicate either a shortage of refrigerant or an open float valve.

Check the suction line. If it is not cold or frosted outside the cabinet, there is a shortage of refrigerant, and sufficient refrigerant to seal the float, stop the noise, and reduce low side pressure, should be added.

If the suction line is cold or frosted, the float valve should be flushed, and if flushing does not seal the valve, it must be replaced.

Complaint No. 12: Refrigerant Leaks When Compressor Is Idle

This complaint indicates that the refrigerant leaks only when the compressor is not running.

From the study of the cycle of refrigeration, it is noted that during the on-cycle the low side pressure is reduced or maintained at a low, while this pressure increases during the off-cycle of the compressor.

With SO_2 or isobutane as the refrigerant the compressor usually cuts in above 0 lb. gauge and operates in a vacuum. Methyl chloride and Freon units cut in and operate with a pressure on the low side above 0 lb. gauge. In either case, the pressure during the off-cycle is higher than during the on-cycle.

This complaint then would throw light on the fact that the leak is on the low side of the system and is so slight or of such a nature that it is not noticeable at the lower operating pressure, but the leak becomes evident as the pressure increases during the off-cycle.

If such is the case, the combination gauge set should be installed and valves 7 and 6 opened to pass the high pressure into the low pressure side to around 35 lbs. All joints and connections should be carefully checked for leaks and any leaks located should be repaired.

The majority of such complaints may be traced to a leak at the stuffing box seal. The stuffing box seal should be carefully tested for leaks, and replaced or repaired if found to be leaking.

It is also possible that the leak is around the low pressure control bellows. It should be checked as well as all other parts on the low side.

A very fine sand hole in the compressor casting may be found which would allow a slight leak under the higher pressure. Such a leak would generally be accompanied by traces of oil on the casting. A sand hole may be closed by tapping a circle immediately around the sand hole with a center punch, then mashing the hole closed with a bolt-pen hammer or a blunt punch.

Check all gasketed joints around the service valves and around the compressor body parts. It is well to repeat, that new gaskets should always be used when making a repair or replacement as this may prevent a gas leak at some future date.

Complaint No. 13: Food Freezing In the Refrigerator

This complaint would suggest that there is too much refrigeration taking place, which means that the compressor is operating more than necessary.

The switch setting should be checked, and if out of adjustment, set back its regular cutting-in and cutting-out points. If the evaporator is very cold and is slow to cut-in, pressure from the high side may be passed slowly through the combination gauge set to the low side to build the pressure up to the cutting in point.

A slight leak in the discharge valve will, by increasing the low side pressure prematurely, cause the low pressure control to cut in before the refrigerator has reached the regular cut in temperature and result in a lower than average temperature, even with the control properly adjusted.

If the float valve is holding open slightly, the low pressure control would be affected just as with a leaky discharge valve.

Refrigerators placed on open or unheated porches in extremely cold weather may freeze food although the compressor operates very little. This condition may be corrected by heating the space or removing the refrigerator to a heated space.

A ground in the switch circuit which would keep the motor running even though the control contacts were open is another possible cause.

Complaint No. 14: Set Refrigerator Colder

This is a very common customer complaint.

It is most often due to causes other than the switch setting. However, the switch setting should be checked with the gauges, and the refrigerator temperature noted on an accurate thermometer. Never use the customer's thermometer, as they are invariably cheap and inaccurate. Best method of obtaining an accurate average thermometer reading is to place the thermometer in a vessel of liquid in the center of the refrigerator, that has been in the refrigerator for several hours.

Check the evaporator for too much frost. Check the placement of foods and dishes, to make sure proper circulation is provided.

If the location of the refrigerator is such that it is exposed to unusually high room temperatures, or if the refrigerator is getting more than normal usage, the control may be set lower than average. Inform the user that with the lower switch setting the compressor will operate more and increase the cost of operation.

In most cases by defrosting and rearranging the foods and dishes, the average setting will provide a sufficiently low temperature. Reason with the user that a temperature just below 50° F. is satisfactory and economical.

Complaint No. 15: Machine Will Not Run

Operate the control by hand, and if the motor does not make an at-

(Concluded on Page 18, Column 3)

Type 1A Flooded System

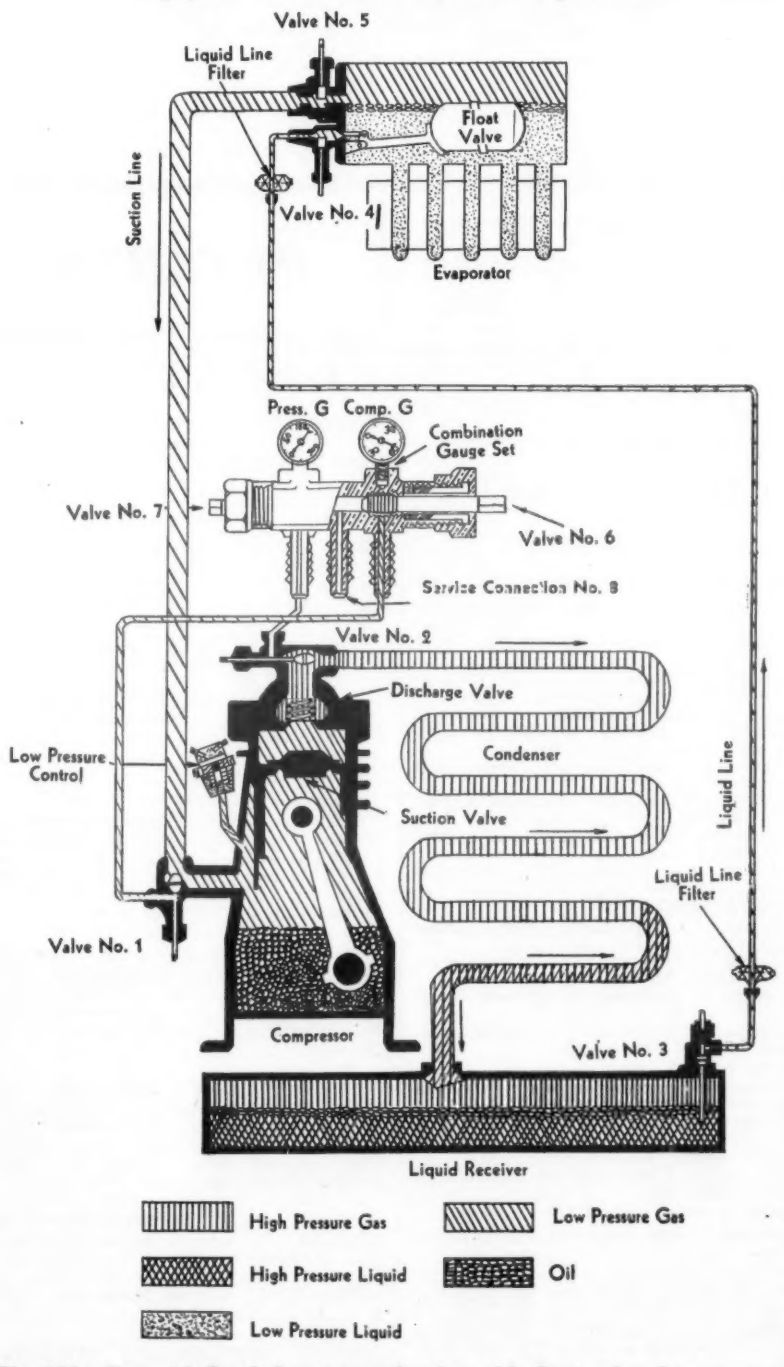


Fig. 135—Type 1A flooded system using low side float valve, low pressure control, and having two evaporator service valves (No. 4 and No. 5). Common service complaints and remedies for this system are described in this issue.

Service Complaints On Type 1A Systems

(*Concluded from Page 17, Column 3*)

tempt to run, check either the fuses or the overload relay. If the fuses are good, or if the relay is reset, check all the electrical connections with a test lamp to see that current is being supplied right up to the motor leads.

If current is going into the motor, check the brushes and commutator. The commutator may be coated with dirt preventing contact, or the brushes may not be touching the commutator.

If the brushes are in contact with the commutator, and the motor still does not run, with the belt removed, rotate the motor by hand. If by turning the armature slightly, the motor starts, it would indicate a dead spot in the commutator.

After checking all these conditions, and motor still remains dead, it must be burned out and must be replaced.

Complaint No. 16: Refrigerator Not Cold Enough

Check and proceed as in Complaint No. 11.

Complaint No. 17: Will Not Freeze Ice

Check for a shortage of refrigerant, or an inefficient compressor. Check the switch setting.

Question the user as to the approximate ice freezing time. Many users expect ice to freeze in too short a period. Reason with them, and attempt to determine if this conditon is chronic.

This complaint is frequent after defrosting, and especially during hot weather when the demand for ice cubes is highest, and the system is taxed to its limit in maintaining a cold refrigerator against high food, water, and outside temperatures.

Complaint No. 18: Lines Frosting, Water Dripping on Floor

This complaint would suggest that refrigeration was taking place outside the refrigerator.

Check the suction line and if it is frosting, the float valve is leaking and should be flushed or replaced.

Should the liquid line be frosting or sweating, it should be traced to locate the point where the frost starts. At this point there is a restriction in the valve, filter or fitting. In some cases where methyl chloride or Freon is used a slight shortage of refrigerant will cause the liquid line to get cold and under humid conditions sweat slightly.

Complaint No. 19: Refrigerator Motor Causing Radio Interference

Very often this complaint is caused by some other source and blamed on to the refrigerator.

Operate the system and have the user point out the suspected radio interference. Then stop the refrigerator and see if the interference continues. If so, the interference is caused by some fixture other than the refrigerator.

With a repulsion-induction or capacitor motor radio interference is nil. If, however, the brushes on a repulsion-inductor motor do not throw out and the motor is running on the brushes due to failure of the short circuiting device, the arcing may cause radio interference. The cause should be corrected.

Direct current motors do set up a static that interferes with the radio. This condition is covered in Chapter 7 under d.c. motors.

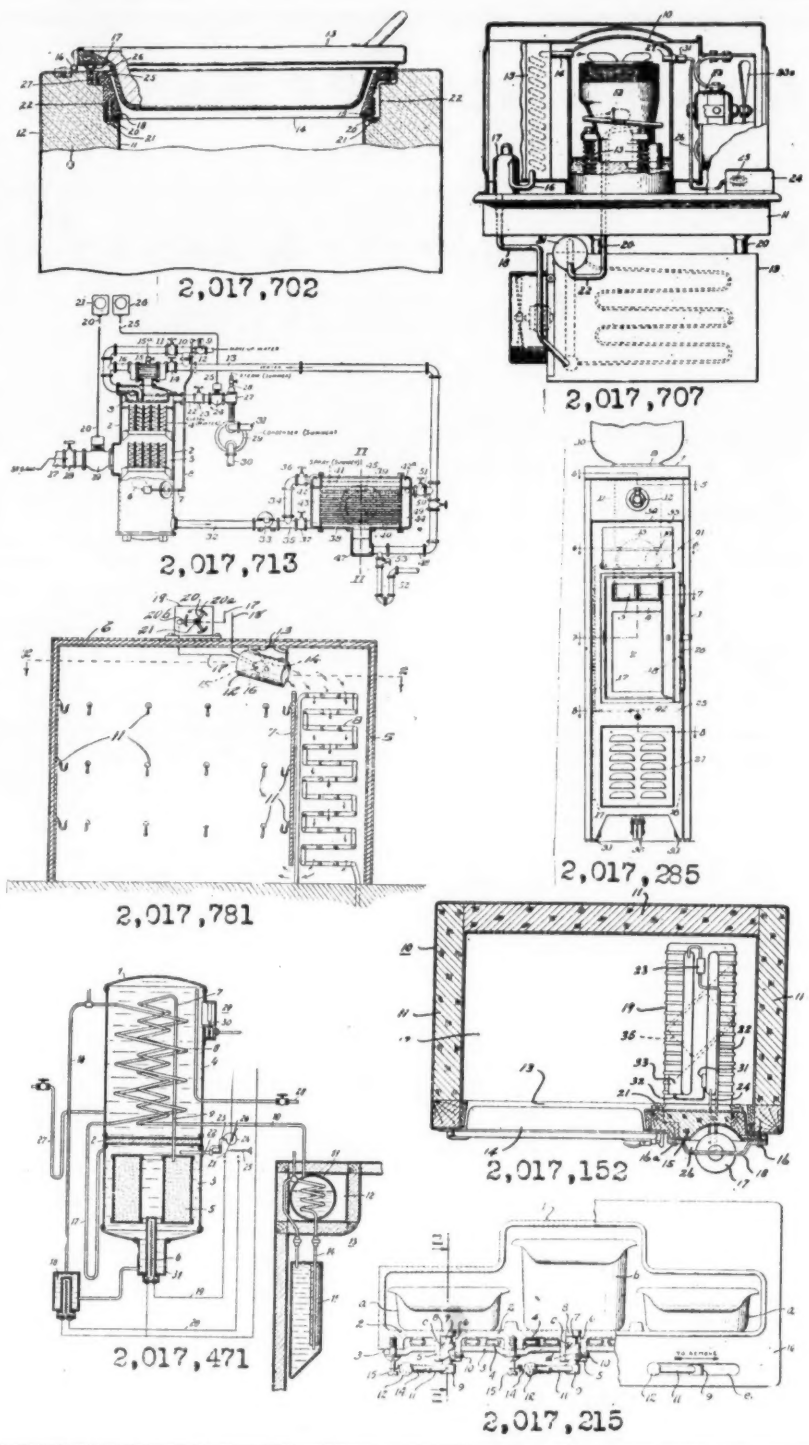
Complaint No. 20: Motor Running Hot

Check the motor bearings to see that they are properly lubricated. Remove the belt and see if the armature turns freely. If the bearings have run dry and hot they may have expanded and are binding the shaft. Lubricate both bearings and allow them to cool. If after cooling and oiling they are still tight they must be replaced or reamed out.

Should one or both of the bearings become worn to a point where the armature rubs on the field, the motor will bind at the point of contact, when turning by hand. The motor should be overhauled.

Check the operation of the short-circuiting device to make sure the motor is not running on the brushes. The motor running on the brushes will cause the commutator to become very hot and may melt and throw some of the solder from the commutator.

If the trouble does not seem to be in the motor, re-install the belt and check the head pressure, back pressure, oil in the crankcase, and other conditions that would impose an overload on the motor.



PATENTS

Issued Oct. 15, 1935

2,017,152. REFRIGERATING APPARATUS. Harry B. Hull, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application Jan. 30, 1934. Serial No. 709,011. 13 Claims. (Cl. 62—116.)

2,017,215. REFRIGERATING APPARATUS. Sylvester A. Limpert, Bay Shore, N. Y., assignor to Mechana Kold Corp., Bay Shore, N. Y., a corporation of New York. Application Dec. 9, 1933. Serial No. 701,606. 21 Claims. (Cl. 62—108.5.)

2,017,285. REFRIGERATOR. Carl E. L. Lipman, Chicago, Ill., assignor to Lipman Patents Corp., Chicago, Ill., a corporation of Delaware. Application July 18, 1932. Serial No. 623,077. 10 Claims. (Cl. 62—116.)

2,017,471. ABSORPTION REFRIGERATING MACHINE WITH HEAT RECOVERY. Wulf Berzelius Normelli, Strasbourg, France. Application Aug. 20, 1929. Serial No. 387,221. In Germany Aug. 21, 1928. 10 Claims. (Cl. 62—118.)

2,017,702. REFRIGERATOR CABINET. Delbert F. Newman, Schenectady, N. Y., assignor to General Electric Co., a corporation of New York. Application June 8, 1934. Serial No. 729,622. 3 Claims. (Cl. 220—9.)

2,017,707. FLOW RETARDER FOR COMPRESSORS. Harry A. Whitesel, Fort Wayne, Ind., assignor to General Electric Co., a corporation of New York. Application Jan. 11, 1934. Serial No. 706,219. 9 Claims. (Cl. 62—1.)

2,017,713. AIR CONDITIONING APPARATUS. William S. Elliott, Pittsburgh, Pa., assignor to Elliott Co., Pittsburgh, Pa., a corporation of Pennsylvania. Application July 6, 1933. Serial No. 679,213. 8 Claims. (Cl. 257—8.)

2,017,781. METHOD AND APPARATUS FOR CIRCULATING AND HUMIDIFYING THE AIR IN A REFRIGERATING ROOM AND FOR DEFROSTING. Carl S. Zedlik, Minneapolis, Minn. Application Aug. 25, 1933. Serial No. 686,714. 4 Claims. (Cl. 62—6.)

First 6 Chapters of Master Service Manual Now Available in 112-page Booklet

Published in this issue is Chapter 9, Instalment 3 ("Service of Refrigerators") of the Master Service Manual, prepared by K. M. Newcum. The manual is being published serially in Electric Refrigeration News, the first instalment appearing in the April 10, 1935, issue. When all the chapters have been published in the News, the information will be put in book form, with considerable supplementary material.

This manual of information on the design and operation of present-day refrigeration systems will add to the service man's knowledge, and will assist him in meeting specific problems in servicing operations in the field.

Our supply of some of the back issues has been sold out. In order to meet the demand for the complete series we make the following offers to service men:

(1) Send $3.00 for a year's subscription to Electric Refrigeration News to start Aug. 28, 1935, and we will send reprints of all previous Newcum articles (the first six chapters of the book) in pamphlet form (size 6¼x8¾ inches).

(2) Send your advance order for a copy of the Master Service Manual, enclosing $3.00 to pay for the complete book, when published, and we will send you free of charge, reprints of all the Newcum articles published in the News up to and including Aug. 21, 1935. These reprints are in pamphlet form size 6¼x8¾ inches).

Following is an outline of the subjects and the dates of the weekly issues of Electric Refrigeration News in which the material was published:

Chapter 1—THEORY OF REFRIGERATION (April 10).

Chapter 2—PRINCIPLES OF MECHANICAL REFRIGERATION (April 17).

Chapter 3—COMMON REFRIGERANTS (April 24).

Chapter 4—CONDENSING UNITS.

Instalment 1: description of various compressor parts (May 1).

Instalment 2: stuffing box seals, flywheels, and direct-connected units (May 8).

Instalment 3: rotary compressors (May 29).

Instalment 4: care and servicing of shut-off valves and gaskets (June 5).

Instalment 5: condensers (June 12).

Instalment 6: liquid receivers (June 19).

Chapter 5—EVAPORATORS.

Instalment 1: flooded evaporators with low side float valve (June 26).

Instalment 2: high side float valves and flooded evaporators (July 3).

Instalment 3: automatic expansion valves (July 10).

Instalment 4: automatic expansion valves —continued (July 17).

Instalment 5: thermostatic expansion valves (July 24).

Chapter 6—CONTROLS.

Instalment 1: low pressure controls (July 31).

Instalment 2: low pressure controls—continued (Aug. 7).

Instalment 3: thermostatic controls (Aug. 14).

Instalment 4: thermostatic controls—continued (Aug. 21).

Chapter 7—MOTORS.

Instalment 1: repulsion start-induction run motors (Aug. 28).

Instalment 2: repulsion start-induction run motors (continued) and capacitor motors (Sept. 4).

Instalment 3: direct current motors and belts (Sept. 11).

Chapter 8—INSTALLATION

Instalment 1: installation of refrigerators (Sept. 18).

Instalment 2: correct use of fittings in making joints (Sept. 25).

Chapter 9—SERVICE.

Instalment 1: classification of systems and use of combination gauge set (Oct. 16).

Instalment 2: service complaints and remedies on Type 1A flooded systems (Oct. 23).

Instalment 3: service complaints and remedies on Type 1A flooded systems —continued (Oct. 30).

Group Subscription Rates

The following special rates are for PAID-IN-ADVANCE subscriptions only in the United States and Possessions and Pan-American Postal Union Countries. Charge orders are billed at the single-subscription rate, regardless of number. Papers will be mailed to individual addresses.

	Electric Refrigeration News (weekly)	1935 Refrigeration Directory and Market Data Book (2 volumes)	Both Electric Refrigeration News and Directory and Data Book
1 subscription	$3.00	$5.00	$6.50
5 or more each	2.75	4.50	6.50
10 or more each	2.50	4.00	6.50
20 or more each	2.25	3.50	5.75
50 or more each	2.00	3.00	5.00
75 or more each	1.75	2.50	4.25
100 or more each	1.50	2.00	3.50
For All Other Countries (Except Canada)			
1 subscription	$5.00	$6.00	$9.00
5 or more each	4.75	5.50	8.50
10 or more each	4.50	5.00	8.00
20 or more each	4.25	4.50	7.50
50 or more each	4.00	4.00	7.00
Canadian Rates (including tariff of 5 cents per copy on the News)			
1 subscription	$6.00	$6.00*	$11.00*
5 or more each	5.75	5.50*	10.50*
10 or more each	5.50	5.00*	10.00*
20 or more each	5.25	4.50*	9.50*
50 or more each	5.00	4.00*	9.00*

*Canadian subscribers are required to pay a tariff and excise tax on the Directory and Market Data Book which amount to $1.00. These extra charges on books will be collected by the Canadian postoffice at the time of delivery.

QUESTIONS

Cavalier Compressor

No. 2539 (Technical School, Honolulu)—"As a subscriber to your paper we notice in the issue of Sept. 25 a list of patents issued Sept. 10, and we are very interested in Patent No. 2,013,777, a rotary compressor designed by James Dennedy and assigned to the Rotorite Corp. of Chicago.

"Looking at the drawing published, it looks as though this compressor is the exact duplicate of the compressor used in the Cavalier machine made by the Tennessee Furniture Co. or sold by them in 1931 and 1932. At the present time we are anxious to get some parts for these machines and do not believe that the Tennessee Furniture Co. is in business any more but that the recently patented compressor, although possibly the same one as the Cavalier unit, has been reassigned or sold.

"Is this unit the same as the Cavalier? Is the Tennessee Furniture Co. of Chattanooga, Tenn., still in the refrigeration business? Where can we obtain a set of compressor blades and a cylinder for these machines?"

Answer: Compressors for the Cavalier electric refrigerator were manufactured by Sunbeam Electric Mfg. Co., Evansville, Ind. As the Tennessee Furniture Co. is no longer manufacturing the Cavalier electric refrigerator, it probably would be best to contact the Sunbeam company directly for compressor parts.

Sunbeam has manufactured a compressor under the patents of the Rotorite Corp., which is a patent holding corporation of Chicago.

Commercial Specifications

No. 2540 (Engineering Bureau, Netherlands)—"In the March 14, 1934, issue, specifications were given of all 1934 commercial condensing units. We should like to know the same specifications of the 1935 condensing units.

"Please inform us if you have already published same. If so, please let us have two copies of the number in question.

"If you have not yet published them, will you kindly let us know if it is possible to obtain said specifications in any other book or newspaper?"

Answer: Specifications of 1935 models of commercial condensing units were published in the April 3, 1935, issue of ELECTRIC REFRIGERATION NEWS. Unfortunately our stock of this issue is sold out.

Norge Service Data

No. 2541 (Dealer, New York)—"I desire to obtain service data or a service manual on Norge refrigerators.

"What material have you available up to the present date. Please advise me how complete it is and the cost, also how soon I could obtain this information.

"I would also like to obtain service data or a service manual on Frigidaire."

Answer: The MASTER SERVICE MANUAL which we are now compiling will cover broadly the service operations on types and makes of household electric refrigerators now being sold in great quantities by the leading manufacturers.

Detailed instructions regarding the methods of handling each of the problems most commonly encountered in practical experience will be published in this book.

This manual will consist of a compilation of the series of articles by Mr. K. M. Newcum published in the weekly issues of ELECTRIC REFRIGERATION NEWS, together with other supplementary material.

The Newcum articles have appeared in 24 issues of ELECTRIC REFRIGERATION NEWS up to the present date. An outline of the material which has been published to date will be found on page 18 of this issue.

Rice Hardware

No. 2542 (Real Estate Investment Firm, New York)—"Will you please advise us where we may be able to locate the Rice cabinets. The purpose of this inquiry is because we are in need of some door handles where Frigidaire units were installed in Rice cabinets.

"The Frigidaire Co. has suggested that we write to you for the above information."

Answer: Contact Isaac Rice, Jr., 295 Fifth Ave., New York City, for information on Rice refrigerators.

List of Service Men

No. 2543 (Manufacturers' Agent, District of Columbia)—"I am very much interested in having a complete list, preferably in book form, of all of the independent refrigeration service men or dealers throughout the country, and I am also interested in keeping this list up to date.

"No doubt two problems are presented in the above requirements. Please let me have your suggestions as to the best method of answering both problems. Also the cost involved.

"For your information, I am selling electric water coolers on U. S. Government projects, including post-offices, for contracts in practically every state in the Union."

Answer: You will find a list of independent refrigeration service men published in the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY. Please note, however, that this list is not large and in no manner complete. As stated in the "Foreword" of the Directory:

"We make no claim to completeness in connection with this new section. Much time and effort has been expended in collecting information but these branches of the industry are still in the promising stage. In another year, perhaps, we may be able to furnish a more accurate and comprehensive directory of these service groups."

State Distribution

No. 2544 (Publisher, California)—"The electric refrigeration department of the General Electric Co. here in the city advises me that perhaps you can furnish us with definite information showing the number of electric refrigerators in the homes of the 11 western states. I would like to secure these figures for each of these states for 1934 and for two or three years previous if you have them available.

"Provided the information, either actual or estimated, is published in a 1935 issue, we will be pleased to have you send us a copy or copies if statistics are in more than one issue. We will appreciate this help from your publication and thank you now for whatever information you are able to send us."

Answer: The total number of refrigerators sold in each individual state during each of the years of 1934, 1933, and 1932 is given in the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK. Also in this book are figures showing the total number of refrigerators sold during all years previous to 1932 given individually by states.

The 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK presents all known statistical facts about the refrigeration and air-conditioning industries, including an analysis of the market and a survey of distributive channels.

Meat Block Resurfacer

No. 2545 (Dealer, Mississippi)—"Will you please give us the address of parties making a machine for refacing meat blocks. This outfit consists of an electric motor attached to a saw that re-faces the block."

Answer: The following companies manufacture machines for resurfacing meat blocks:

Heath Co., 210 Lafayette St., New York City; and Michigan Maple Block Co., Petoskey, Mich.

Klingtite Gasket Tacker

No. 2546 (Dealer, Mississippi)—Will you be so kind as to advise us the name of the company that manufactures the Klingtite gasket tacker?"

Answer: Try the U. S. Indestructible Gasket Co., 827 E. 15th St., Brooklyn, N. Y., for information regarding the Klingtite gasket tacker.

Air-Conditioning Data

No. 2547 (Manufacturer, New York)—"In your Feb. 6, 1935, issue, you list a summary of air-conditioning installations in Chicago on pages 10 and 11. I am wondering if you are in a position to furnish me with this information in reference to New York City?"

Answer: Data on the installation of air-conditioning equipment in New York City, as well as in some 30 major cities, is given in the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK.

This information is in the form of tables showing the number of installations by market classifications (restaurants, theaters, etc.), and the total tonnage and horsepower.

The information as to make of unit installed and distributor installing it is not included, as this type of information is available only for two or three cities.

CLASSIFIED

RATES: Fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS WANTED

A MANUFACTURER wanting to capitalize the opportunity of firmly establishing his position in the growing supply jobbing field will find an asset in an available man with background of six years appointing and developing jobbing accounts, five years contacting refrigeration outlets, and now selling to independent service and installation organizations. Box 738, Electric Refrigeration News.

THREE YEARS' engineering experience in domestic and commercial refrigeration, oil burners, and air conditioning. Twenty-eight years old. Graduate mechanical engineer, University of Michigan. Member Tau Beta Pi, Phi Kappa Phi, and Sigma Xi Honorary Societies. College specialties included refrigeration, air conditioning, heating and ventilation, thermodynamics, steam power plant engineering. Box 739, Electric Refrigeration News.

PURCHASING AGENT now with well known manufacturer wants connection with house offering greater opportunities for advancement. Now buying refrigeration, air conditioning, oil burner and general electrical and machinery equipment. Also familiar with printing and advertising materials. Age 31, married, good basic education and training. Nominal salary. Box 740, Electric Refrigeration News.

FRANCHISE WANTED

NEW YORK CITY service company desires manufacturer's service agency. Completely equipped shop, employing armature winders and machinists. Capable of doing any kind of repairs. Competent outside men. Well established; reliable. Can furnish highest recommendations. Invite investigation. Box 736. Electric Refrigeration News.

NEW YORK CITY Manufacturers' Agent wants to represent in Metropolitan area reputable and responsible manufacturers of commercial refrigerators, refrigeration and kindred accessories. Have successful sales record twelve years' executive experience that invites investigation. Excellent office facilities Grand Central district established. Prefer commission arrangement. Interested only in bona fide proposition. Box 737, Electric Refrigeration News.

EQUIPMENT WANTED

300 TO 500 ice cream cabinet lids, 1-23/32", hard rubber and polished metal, new, used or rebuilt. Will also buy any refrigeration equipment in quantity, compressors, motors, controls, etc. Special sale, refrigeration fan pulleys 8 for $1.00. Pioneer Refrigeration Equipment Co., 33 Warren St., New York City.

EQUIPMENT FOR SALE

NEW six hole double ice cream cabinets, portable type, complete with ⅓ HP new compressor units less motors. Size 30"x30"x60", at $85.00. Cabinet only at $60.00. New Penn thermostats, $4.00. Rebuilt and guaranteed 1 HP Frigidaire units complete with motors, $95.00. ½ HP at $65.00. All prices FOB our store. New Larkin, Bush, Frigidaire coils less than half price. Pioneer Refrigeration Equipment Co., 33 Warren St., New York City.

ISOBUTANE: We offer purest and dryest Isobutane for the most exacting scientific purposes; in your 80 lb. cylinders at $0.75, in our 120 lb. cylinders, $0.70, in small lots at $1.00 per pound. The Standard Refrigeration Co. of Pittsburgh, 1138 Dohrman St., McKees Rocks, Pa.

FOR IMMEDIATE SALE: Frigidaire condensing units, in perfect condition, ¼ H.P., Model S. complete with two tray float evaporator $14.00, less motor $9.00. Model G twin cylinder complete $20.00, less motor $15.00. Enquiries for other equipment solicited. Elbros Electric Co., Inc., 45 W. 20th St., New York City.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. Van Deventer (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

REPAIRS

HALECTRIC thermostat repair service. B & B, G.E., Cutler-Hammer, Penn, Ranco, Tag., etc. Expansion valves repaired. Gas service, Ethyl, Methyl, Iso-Butane, Sulphur. Your cylinder or ours. Competitive prices. Halectric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

REBUILDING of ice cream cabinet coils, complete dismanteling, all tubes silver-welded, flange flooded in anew, thoroughly cleaned, cadmium plated, equal to new coil. Frigidaire or Kelvinator 20X, $6.00—22X, $7.00—less float. Also Kelvinator Yukon boilers completely rebuilt and plated, $4.00 each. Refrigeration Specialty Co., 725 Atlantic Ave., Brooklyn, N. Y.

HERMETIC UNITS REPAIRED

GENERAL ELECTRIC SEALED UNITS—repaired, rebuilt, exchanged. Guaranteed service. Our modern shop is especially equipped to efficiently repair these units. Prices low and workmanship the best. Give model number when writing. Immediate service. Rex Refrigeration Service, 446 East 79th St., Chicago.